NORTHERN ADA COUNTY
PM_{10} SIP MAINTENANCE PLAN AND REDESIGNATION REQUEST

Prepared for

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LIST OF ACRONYMS AND TERMS

ACHD	Ada County Highway District
AIRS	Aerometric Information Retrieval System
AP-42	EPA's current edition of air pollution emissions factors
AQI	Air Quality Index
AQIP	Air Quality Improvement Plan
BMSA	Boise Metropolitan Statistical Area
CAA	Clean Air Act
CAMx	Comprehensive Air Quality Model with Extensions
CARB	California Air Resources Board
CFR	Code of Federal Regulations
CMB	Chemical Mass Balance
CO	Carbon Monoxide
COMPASS	Community Planning Association; metropolitan planning organization for Ada County
DEQ	Idaho Department of Environmental Quality
DRI	Desert Research Institute
DOT	Department of Transportation
EDF	Environmental Defense Fund
EI	Emission Inventory
EIIP	Emission Inventory Improvement Program
EPA	Environmental Protection Agency
FHWA	Federal Highway Administration
FR	Federal Register
Hi-Vol	High Volume air sampler
HDDV	Heavy Duty Diesel Vehicle
ICAF	Idaho Clean Air Force
I/M	Vehicle inspection and maintenance program
IDAPA	Idaho Administrative Procedures Act, contains Idaho's state rules for the control of air pollution
IMPROVE	Interagency Monitoring of Protected Visual Environments
IPP	Inventory Preparation Plan

ISTEA	International Surface Transportation Efficiency Act of 1991
ITD	Idaho Transportation Department
KG	Kilogram - metric measurement of weight
lb	Pound - standard measurement of weight
MM5	Fifth Generation Mesoscale Model
$\mu g/m^3$	micrograms per cubic meter
MOBILE6	EPA's latest computer program for compiling emissions from mobile sources
MPO	Metropolitan Planning Organization
MSA	Metropolitan Statistical Area
MVEB	Motor Vehicle Emissions Budget
NAA	Nonattainment Area
NAAQS	National Ambient Air Quality Standards
NAMS	National Air Monitoring Site
NH3	Ammonia
NOx	Oxides of Nitrogen
NSR	New Source Review
PART5	EPA's On-road Mobile Particulate Emissions Factor Model, version 5
ppm	Parts per million
PM_{10}	Particulate matter 10 microns or less in diameter
$PM_{2.5}$	Particulate matter 2.5 microns or less in diameter
PSD	Prevention of Significant Deterioration
PSQ	Point Source Questionnaire
PTE	Potential to Emit
QA	Quality Assurance
QAP	Quality Assurance Plan
QC	Quality Control
RACM	Reasonably Available Control Measures
RACT	Reasonably Available Control Technology
SIP	State Implementation Plan
SLAMS	State and Local Air Monitoring Site
SPM	Special Purpose Monitor
TCM	Transportation Control Measures
TEOM	Tapered Element Oscillating Microbalance
Tier II	Second round of EPA operating permits

TON	Weight of 2,000 pounds (LB)
tpy	Tons per year
TSP	Total Suspended Particulate matter
VMT	Vehicle miles traveled
VOC	Volatile Organic Compounds
Winter	Defined as Nov, Dec, Jan & Feb for this SIP

1.0 EXECUTIVE SUMMARY

The Clean Air Act (CAA) amendments of 1990, Section 107(d)(3)(E), states that an area can be redesignated to attainment status if specific conditions are met:

- The Administrator of the U.S. Environmental Protection Agency (EPA) determines that the area has attained the National Ambient Air Quality Standards (NAAQS)
- The Administrator has fully approved the applicable implementation plan for the area under Section 110(k)
- The Administrator determines that the improvement in air quality is due to permanent and enforceable reductions in emissions resulting from implementation of the applicable implementation plan and applicable Federal air pollutant control regulations and other permanent and enforceable reductions
- The Administrator has fully approved a maintenance plan for the area as meeting the requirements of Section 175A
- The State containing such area has met all requirements applicable under Section 110 and part D.

This document demonstrates that all of these CAA requirements for attainment have been met, summarizes the progress of the area in attaining the annual and 24-hour PM_{10} standards, and includes a maintenance plan to ensure continued attainment for ten years after the redesignation. The document is a formal request to the U.S. EPA to redesignate the *former* Northern Ada County, Idaho PM_{10} Nonattainment area to attainment of the health-based 24-hour average and annual average PM_{10} NAAQS.

The Northern Ada County area has been identified as a PM_{10} area of concern since the promulgation of the PM_{10} NAAQS in 1987, and was formally designated as a moderate PM_{10} nonattainment area upon passage of the 1990 CAA. Idaho developed a State Implementation Plan (SIP), including two revisions, and submitted them to EPA in November 1991, December 1994, and July 1995. EPA gave final approval to the Northern Ada County SIP in May 1996. EPA revised the PM_{10} NAAQS in 1997 and Idaho demonstrated to the EPA's satisfaction that it complied with the new standard. As a result, EPA rescinded the applicability of the PM_{10} NAAQS in Northern Ada County on March 12, 1999. Shortly thereafter, litigation at the national level vacated the new PM_{10} NAAQS. Subsequently, litigation by the Idaho Clean Air Force and others to have EPA restore the federal standards to Northern Ada County resulted in a settlement agreement to require Idaho submit a PM_{10} Maintenance SIP by September 30, 2002 and for the EPA to take final action within one year. This document, with its revisions following public hearing and comment, will serve as the State's submittal.

The PM_{10} NAAQS are set at 150 $\mu g/m^3$ for the 24-hour average, measured from midnight to midnight, and 50 $\mu g/m^3$ for the annual average, based on the calendar year. Four monitoring sites in Northern Ada County have nine or more years of data during the 1986-2002 time

period. Since 1986, seven values exceeding the 24-hour standard have been recorded in the Northern Ada County area. With one exception, the exceedances were all measured in winter months (January), and were all recorded in 1991 or earlier. The highest measured 24-hour PM_{10} value was 314 $\mu g/m^3$ measured at the downtown Boise fire station in January 1986. With the exception of an agricultural-influenced exceedance in 1997, no exceedances have been recorded since 1991. Northern Ada County has exceeded the annual standard PM_{10} of 50 $\mu g/m^3$ only once, in 1986. Finally, the maximum PM_{10} concentration measured in Northern Ada County in 2001 was 85 $\mu g/m^3$, measured at the downtown Boise fire station. The annual arithmetic mean for 2001 at this site was 29.9 $\mu g/m^3$. Thus, the three-year average 24-hour value was less than one exceedance per year and the three-year annual average was less than 50 $\mu g/m^3$. Based upon monitoring data, the area clearly has attained the 24-hour and annual PM_{10} NAAQS.

Emission inventories were developed for direct emissions of PM_{10}, and for PM_{10} precursors – nitrogen oxides (NO_x), sulfur oxides (SO_x), volatile organic compounds (VOCs), carbon monoxide (CO), and ammonia (NH_3). Annual emissions were estimated for the 1999 base year, and for three future years – 2010, 2015, and 2020. For on-road mobile sources, the MOBILE6 and PART5 emission factor models were used. Episodic emission inventories were developed using meteorological data from historical worst-case episodes. The 1999 episode was for the seven-day period December 20 through December 26.

For future year air quality modeling, emissions were projected to the future years using meteorology from the worst-case episode that occurred during the nine-day period January 1-9, 1991. Annual PM_{10} emissions are primarily from fugitive road dust and agricultural activities. Annual and episodic NO_X emissions are primarily from on-road and off-road mobile sources. On the December 24, 1999 episode day, almost 90 percent of the PM_{10} emissions are from fugitive road dust, and about 7 percent of the emissions are from residential wood combustion. Using EPA guidance, future year point source emissions are at permitted or allowable levels, while the base year emissions are actual levels, resulting in a significant difference between base year and future year stationary source inventories. However, in actuality it is expected that growth of point sources will be much less than the currently permitted levels.

Under Section 176(c) of the CAA, transportation plans, programs, and projects in maintenance areas must conform to the on-road motor vehicle emissions budgets (MVEB) specified in the applicable SIP. The MVEB for PM_{10} is comprised of the fugitive dust from paved and unpaved roads, and the vehicle emissions (exhaust, tire wear, and brake wear). The budget only applies to Northern Ada County, and to the maintenance year (2015). The 2015 MVEB is 75.8 tons per day PM_{10}. However, a 33% safety margin has been added to account for the longer time frames required by Federal transportation law in adopting Regional Transportation Plans. The MVEB for Ada County for transportation conformity purposes are: PM_{10}: 100 tpd; VOC: 5.0 tpd; and NOx: 7.8 tpd.

The effort to demonstrate attainment and maintenance of the PM_{10} standard involved the use of rollback, receptor, and dispersion models. The episodic dispersion model selected for this study was CAMx, a Eulerian (gridded) photochemical model with a reduced-form aerosol chemistry algorithm. The modeling grid domain was configured to cover the focus area of Ada and Canyon counties, and surrounding environs, with 1 km grid cell size. The vertical

depth of the domain extended from the surface to about 1500 meters. Meteorological conditions leading to measured 24-hour PM_{10} exceedances in Ada County were examined to determine an appropriate worst-case meteorological episode for attainment demonstration purposes. Based upon the analysis of the historical meteorological conditions for four candidate episodes, DEQ selected the *January 1991 episode as the worst-case episode* to be used for the attainment demonstration modeling. Given the data constraints of the 1991 episode, the improved PM and meteorological measurement database available from the 1999/2000 DRI Treasure Valley Secondary Aerosol Study, and the need for an updated 1999 emissions inventory with significantly more detail, *it was decided that the base year dispersion model performance evaluation would be conducted for the December 20-24, 1999 episode*. The maximum-modeled concentrations for all future year scenarios under the meteorological conditions of the December 1999 period all occur on December 24 (127, 139, and 143 $\mu g/m^3$). No days in the December 1999 episode are predicted to be over the standard in any future year. Episodic rollback modeling conducted by the DEQ also supported these conclusions.

The rollback model-predicted annual average PM_{10} concentration in the Treasure Valley for 2020 is 38 $\mu g/m^3$. According to the data collected from 1994 through 2000, the PM_{10} concentration remained virtually constant when the highest 10% of days were filtered out, although the area was growing consistently. The results indicate that the control of episodic emissions during winter and summer/fall high PM_{10} events will be effective in lowering the annual average concentrations.

The CAA requires the State to make a commitment to continued air monitoring and verification of attainment, which Idaho commits to in this document. The DEQ also commits to submit a maintenance plan for the second ten-year period (2013-2023) no later than September 30, 2011.

The control strategy in this Maintenance Plan document consists of the measures in the approved 1991 attainment SIP and additional contingency measures. The key 1991 SIP measures, revised and enhanced in the 1994 and 1995 supplemental submissions, are residential wood burning and open burning programs. Both consist of voluntary and mandatory bans in the various communities and unincorporated areas of Northern Ada County during periods of high PM_{10} levels. Additionally, DEQ is in the process of reducing emission limits of several facilities that currently have large allowable emission permits. In total, 13 point sources required new permits to reduce allowable emission to meet air quality standards. In addition to the 13 point sources mentioned above, the Amalgamated Sugar Company (TASCO) in Canyon County was shown to potentially contribute to PM_{10} exceedances in both Ada and Canyon Counties. To address this problem, DEQ has issued a new Tier II Operating Permit that requires the company to reduce emissions sufficiently to address these air quality concerns.

Contingency measures in the 1991 SIP include over control in the wood smoke program (25% reduction versus only needing 8% reduction to attain standard) and a reduction of fugitive road dust through a road sweeping program designed to reduce particulate emissions through prioritizing road sweeping for certain problem areas. Additional contingency measures include material transport load covering, elimination of track out onto paved roads, reduced uncontrolled outdoor burning, expanding the existing vehicle inspection and maintenance (I/M)

program in Ada County, including clean burning woodstoves in mandatory burn ban situations, and local ordinances to prohibit new unpaved roadways or parking lots.

In conclusion, this Maintenance SIP shows that the annual and 24-hour PM_{10} NAAQS have been attained and will be maintained over the next ten years. The request for redesignation of Northern Ada County to attainment for PM_{10} is requested.

2.0 INTRODUCTION

2.1 Background

The Boise Metropolitan Statistical Area (BMSA) is currently one of the fastest growing metropolitan regions in the nation with a 2001 population of over 452,000. The BMSA consists of two counties, Ada County, which is the most populous with a 2001-estimated population of 312,337[1] and the less populous Canyon County. The largest city in the BMSA is Boise, which had a population of 185,787 at the time of the 2000 census. Four additional counties make up the remainder of a larger region known as the Treasure Valley. The modeling area for this study, which covers portions of several counties, is shown on the map in Figure 2-1. The reader should note, however, the Northern Ada County*former* Nonattainment Area that is the applicable area of this PM_{10} SIP Maintenance Plan only covers that portion of Ada County north of the Boise Baseline. This is discussed more specifically in Section 2.2.

The rapid growth of the area, along with its topographical situation in the Boise River Valley, has caused a continuing potential for air pollution problems over the past thirty years. Stagnation periods during the winter, combined with extensive use of wood stoves for heating, have led to exceedances of air quality standards. Beginning with its designation by the federal government as an Air Quality Control Region in 1970, the region has continued to develop strategies to offset the air pollution problem. Pollutants of particular concern have been carbon monoxide and particulate matter. This Plan has come about as a result of EPA's revocation of the 1987 PM_{10} standard and subsequent national litigation that vacated the new PM_{10} standard.

The original ambient air quality standards for particulate matter were established by the EPA in 1971 and were defined as "total suspended particulates" (TSP). During the 1980's, new research showed that the real health concerns from particulate matter generally was associated with those particles smaller than 10 microns (PM_{10}) and EPA proceeded to propose and adopt ambient standards. On July 1, 1987 (52 FR 24634), the EPA revised the National Ambient Air Quality Standards (NAAQS) for particulate matter with a new indicator that includes only those particles with an aerodynamic diameter less than or equal to a nominal 10 micrometers (PM_{10}). (See 40 CFR §50.6). The 24-hour primary PM_{10} standard is 150 micrograms per cubic meter ($\mu g/m^3$), with no more than one expected exceedance per year. The annual primary PM_{10} standard is 50 $\mu g/m^3$ expected annual arithmetic mean. The secondary PM_{10} standards are identical to the primary standards.

On August 7, 1987 (52 FR 29383), EPA identified the Northern Ada County, Idaho area as a PM_{10}"Group I" area of concern, i.e., an area with a 95% or greater likelihood of violating the PM_{10} NAAQS and requiring substantial SIP revisions. The area was subsequently designated as a moderate PM_{10} nonattainment area upon enactment of the Clean Air Act (CAA) Amendments of 1990.

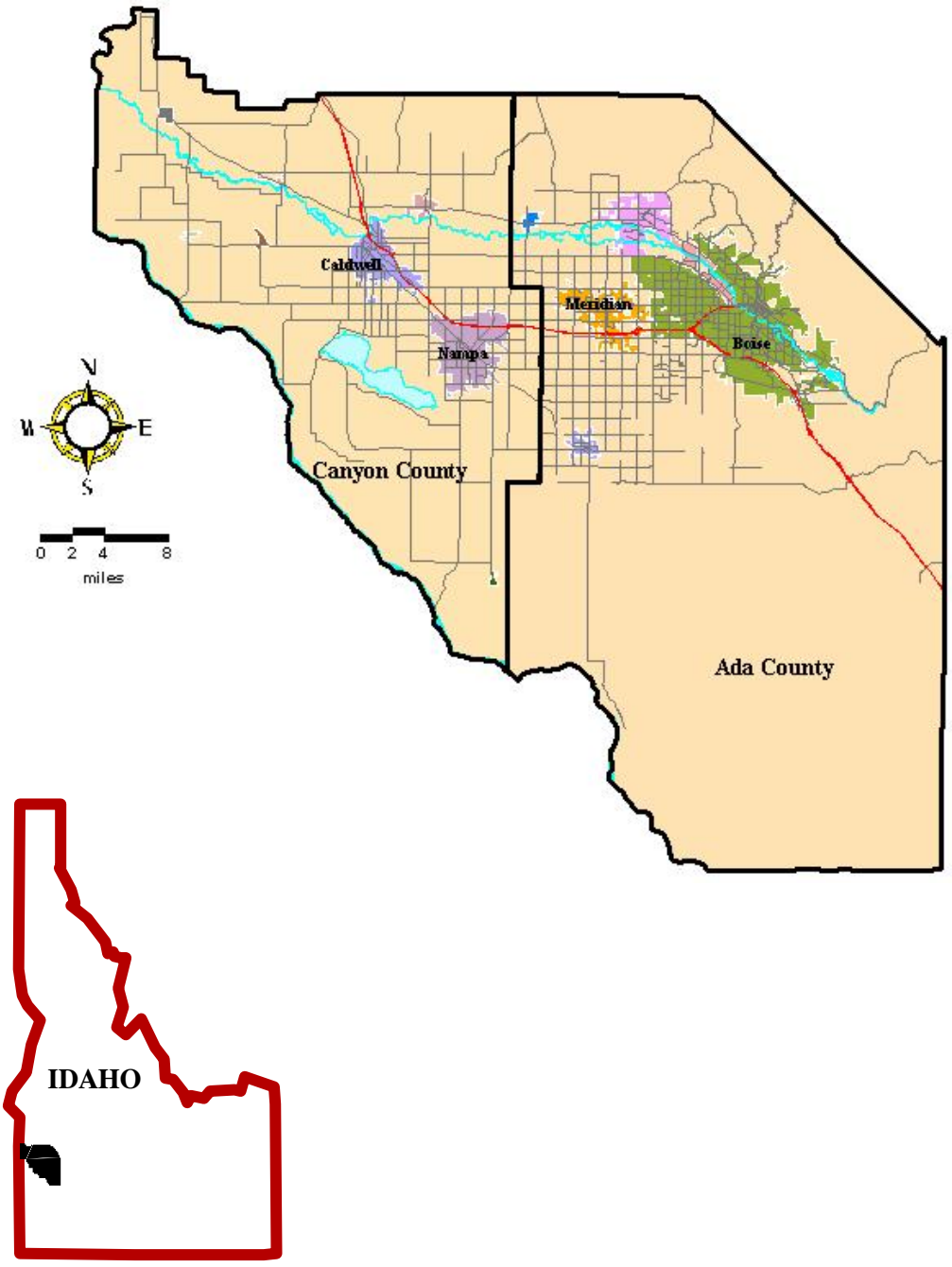

Figure 2-1. Map of the Boise Metropolitan statistical area.

Idaho developed a nonattainment area plan SIP revision to bring about the attainment of the PM_{10} NAAQS. This was submitted to EPA in three parts on November 14, 1991, December 30, 1994, and July 13, 1995. EPA approved this plan as a revision to the Idaho State Implementation Plan (SIP) in a Federal Register Notice published on May 30, 1996 (61 FR 27019).

As part of the CAA's requirement for continual research and examination of health data to determine the validity of the various national ambient air quality standards (NAAQS), EPA found in the mid-1990s that even finer particulates, i.e., $PM_{2.5}$, could be inhaled deeply within the lungs and thus revised a new standard for $PM_{2.5}$ in July, 1997. At the same time, it modified the procedures to determine compliance with the 1987 PM_{10} standards. The new compliance for the average 24-hour PM_{10} standard consists of exceeding the 99% percentile, averaged over three years. This is equivalent to 10 exceedances per year. Pursuant to a request by the state of Idaho in reliance on U.S. EPA guidance, on March 12, 1999, EPA rescinded the applicability of the PM_{10} National Ambient Air Quality Standards (NAAQS) and existing nonattainment designation for Northern Ada County, Idaho (64 FR12257). The Clean Air Force and others challenged the action before the U.S. Court of Appeals for the Ninth Circuit in Clean Air Force et al. V. EPA et al., No's 99-70259 and 70576. On May 14, 1999, the U.S. Appeals for the District of Columbia Circuit decided American Trucking Associations et al. V. EPA, 175 F. 3rd. 1027 (D.C. Cir. 1999), which vacated the new PM_{10} standard promulgated by EPA in 1997, the existence of which formed, in part, the basis for rescinding the applicability of the old PM_{10} NAAQS to Northern Ada County. EPA, the state of Idaho, COMPASS, the Clean Air Force and others agreed that EPA must take some action to restore federal particulate matter regulation in Northern Ada County. Attached, as Appendix G, is a copy of the Settlement Agreement the Parties reached to resolve particulate matter regulation. Settlement of this lawsuit required, among other conditions, that the State of Idaho submit a PM_{10} Maintenance Plan to the US EPA by September 30, 2002. EPA must take final action on this submittal within one year.

2.2 Description of the "former" Northern Ada County PM_{10} Non-Attainment Area

Note: Because EPA revoked the PM_{10} non-attainment status for Northern Ada County in 1999, the following description refers to the "former" non-attainment area boundaries.

Boise and Northern Ada County are located in southwestern Idaho. It is in the Snake River Basin and the Boise River transverses the city and county. Both Canyon and Ada counties have similar geographic situations – located in the high desert country with semi-arid conditions and limited rainfall.

The Clean Air Act requires States to "designate" areas for pollution control and then the deadline for meeting air quality standards is set by the area's "classification" under criteria contained in the Act. Designation is the process under the CAA where the Governor of a state submits to EPA a "subdivision" of the state into geographical areas that either 1) attain the primary and secondary national ambient air quality standards (NAAQS), 2) do not meet the NAAQS either within the individual geographical area or contribute to an adjacent area's attainment problem, or 3) lack available data to classify as attainment or nonattainment. Designations began under the 1967 Air Quality Act as Air Quality Control Regions and continued to be re-defined and refined to the present time. The 1990 CAA, in Section 107, provided additional specificity on the designation process including guidance on boundaries and how to accommodate prior designations such as for PM_{10}. Areas can be redesignated between any of the three categories noted above. Most commonly, an area comes into attainment through the implementation of its SIP and, once that demonstration can be made through use of air quality data and development of an approvable "Maintenance" SIP, the

Governor can request formal redesignation to attainment status. Designation of an area as nonattainment sets in motion a process to develop or revise a SIP under Section 110 of the CAA and, most significantly, Part D of Title I, which extends from Section 171 to Section 193. The designation portion of Section 107 (d)(4) provides additional detail on how ozone, carbon monoxide (CO), and particulate matter nonattainment areas are designated and, in the case of ozone and CO, default boundaries for such areas. The northern portion of Ada County was designated by EPA in 1986 as non-attainment for PM_{10} and thus set in motion a requirement to develop PM_{10} SIP.

Classification is the process by which the Administrator of the EPA applies a specific date for the area to meet the NAAQS (known as the attainment date or deadline). The 1990 CAA modified the earlier approaches of setting a single date for all nonattainment areas, and thus the attainment date depends on the pollutant and the seriousness of air quality problems at the time of enactment of the 1990 CAA. The EPA classified Northern Ada County as a Moderate PM_{10} non-attainment area.

While the growth of the Boise area has spread westward into Canyon County, the official boundaries of the nonattainment area are entirely within Ada County. The CAA did not establish default boundaries for particulate matter areas – only for CO and Ozone. Most of the research studies to support this revised SIP, however, examine the urban portions of both Ada and Canyon counties.

The former Northern Ada County PM_{10} Nonattainment area generally includes all of the Ada County north of the Boise Baseline, i.e., all of the area north of township one (1) north, including township one (1). These boundaries coincide with the Northern Ada County CO Nonattainment area. The boundary remains appropriate to encompass and address the primary source of PM_{10} emissions, residential wood burning. Figure 2-2 contains a map showing these boundaries for the Northern Ada County PM_{10} former Nonattainment Area. For specific details, see 40 CFR 81.313.

2.3 Applicable CAA Requirements

There are several sections of the 1990 CAA that must be satisfied for this PM_{10} Maintenance Plan and Redesignation Request to be approved. The following is a discussion of these requirements and description of how they are met by this SIP.

Section 107(d)(3)(E)

This section describes requirements for an area to be redesignated to attainment. The conditions are as follows:

1. The NAAQS has been attained. The 24-hour PM_{10} standard is attained when the expected number of days with levels above 150 $\mu g/m^3$, averaged over a three year period, is less than or equal to one. This has been the case in Northern Ada County as there has not been a violation of the PM_{10} standard since 1991.

2. The applicable implementation plan has been fully approved under Section 110(k). This occurred on May 30, 1996 (61 FR 27038) when EPA fully approved the Northern Ada County PM_{10} Nonattainment area SIP. This SIP had demonstrated attainment by the December 30, 1994 deadline under the Act for moderate PM_{0} area SIPs.

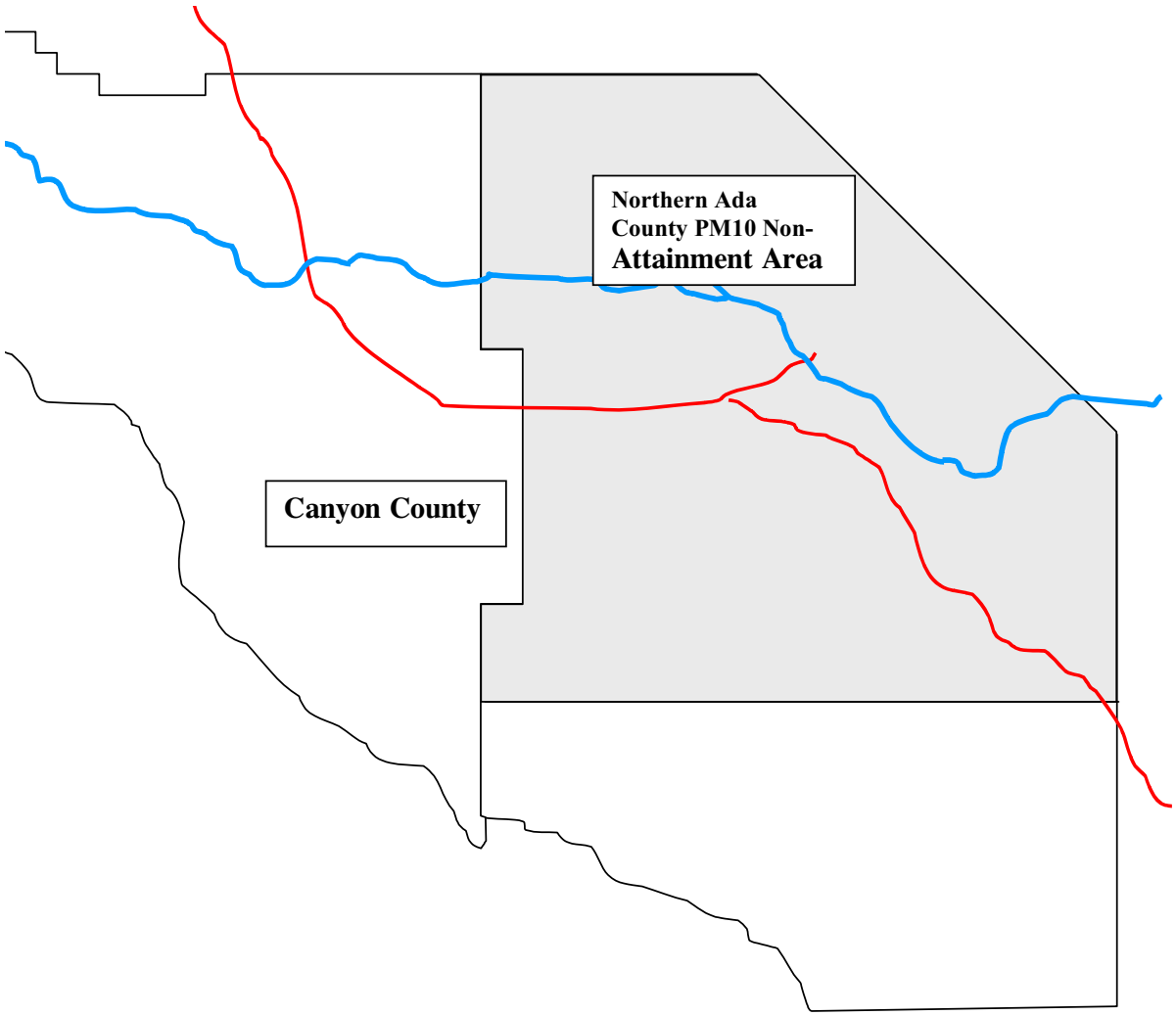

Figure 2-2. Northern Ada County *former* PM_{10} Nonattainment Area.

3. The improvement in air quality is due to permanent and enforceable reductions in emissions. This SIP will demonstrate the enforceable regulations on pollutant sources and state the commitment of the Department of Environmental Quality (DEQ) to enforce these rules.

4. The State has met all applicable requirements for the area under section 110 and Part D. Section 110 contains a list of general requirements for all SIPs to meet. These were met by DEQ in the original, 1991 SIP and remain in place. Part D contains the specific PM_{10} planning requirements for non-attainment areas. They will be discussed in more detail in an upcoming section.

5. A maintenance plan with contingency measures has been fully approved under Section 175(A). This SIP is intended to satisfy these requirements.

Section 110(a)(2)

Section 110(a)(2) of the Act contains general requirements for all implementation plans. These requirements include, but are not limited to, submittal of a SIP that has been adopted by the State after reasonable notice and public hearing, provisions for establishment and operation of appropriate apparatus, methods, systems and procedures necessary to monitor ambient air quality, implementation of a permit program, provisions for Part C – Prevention of Significant Deterioration (PSD) and Part D – New Source Review (NSR) permit programs, criteria for stationary source emission control measures, monitoring, and reporting, provisions for modeling, and provisions for public and local agency participation.

The Northern Ada County PM_{10} Attainment Plan was fully approved by EPA on May 30, 1996 (61 FR 27019). The SIP was reviewed by EPA at the time of approval and found to meet the requisite Section 110(a)(2) general requirements.

Section 172 (c)

This section contains general provisions for nonattainment area plans. A thorough discussion of these requirements may be found in the general preamble to Title I (57 FR 13498 (April 16, 1992)). EPA anticipates that areas will already have met most or all of these requirements to the extent that they are not superseded by more specific Part D requirements. The requirements of this section for reasonable further progress, identification of certain emissions increases, and other measures needed for attainment do not apply to redesignations because they only have meaning for areas not attaining the standard. The requirements for an emission inventory are satisfied by the inventory contained in this maintenance plan. The PSD program will replace the requirements of the Part D NSR program for PM_0 upon the effective date of this redesignation action. The federally approved PSD regulations for Idaho can be found at IDAPA 16.01.012.07, as incorporated by reference by EPA on July 23, 1993. 58FR 39445.

Section 189(a, c, and e)

As a former moderate PM_{10} nonattainment area, Northern Ada County is required to meet Part D, subpart 4, Section 189(a) requirements before the area can be redesignated to attainment. These requirements must be fully approved into the SIP. These requirements are discussed below:

(a) Provisions to assure that Reasonably Available Control Measures (RACM) shall be implemented by December 10, 1993;
(b) Either a demonstration that the plan will provide for attainment as expeditiously as practicable but no later than December 31, 1994, or a demonstration that attainment by that date is impracticable;
(c) Quantitative milestones which are to be achieved every 3 years and which demonstrate reasonable further progress (RFP) toward attainment by December 31, 1994; and
(d) Provisions to assure that the control requirements applicable to major stationary sources of PM_{10} also apply to major stationary sources of PM_{10} precursors except where the Administrator determines that such sources do not contribute significantly to PM_{10} levels which exceed the NAAQS in the area.
(e) Permit program under Section 173 for the construction and operation of new and modified measure stationary sources of PM_{10}.

As previously stated, EPA approved the Northern Ada County PM_{10} SIP, which met the initial requirements of the 1990 amendments for moderate PM_{10} nonattainment areas, on May 30, 1996, (61 FR 27019). This plan included RACM provisions, a demonstration of attainment, and quantitative milestones for demonstrating RFP (Section 189(c) requires the milestones). The plan also included information about major stationary sources of PM_0 precursors (required by Section 189(e)), although these sources were not believed to contribute significantly to PM_{10} in excess of the NAAQS (discussed elsewhere in this SIP).

The permit program for the construction and operation of new and modified stationary sources was due at a later date. States with initial PM_{10} nonattainment areas were required to submit a permit program for the construction and operation of new and modified major stationary sources of PM_{10} by June 30, 1992. States also were to submit contingency measures by November 15, 1993, which become effective without further action by the State or EPA, upon a determination by EPA that the area has failed to achieve RFP or to attain the PM_0 NAAQS by the applicable statutory deadline. See Sections 172(c)(9) and 189(a) and 57 FR 13543-13544.

Idaho did not submit a revision to its permit program for the construction and operation of new and modified major stationary sources of PM_{10} under the CAA amendments of 1990 by the June 30, 1992 deadline. The EPA issued a non-submittal findings letter to Idaho on January 15, 1993 and Idaho was given until July 15, 1994 to correct the NSR program deficiency. DEQ submitted its NSR program on May 17, 1994, and EPA informed the State that the NSR program was complete on June 10, 1994.

Idaho also submitted contingency measures that were a combination of extra control from wood smoke measures and new controls on fugitive road dust. These were submitted on July 13, 1995 and the EPA approved them on May 30, 1996 as part of the nonattainment area plan

contingency measures that would in Northern Ada County if the area failed to attain or maintain the standard. 61 FR 27022.

2.4 Applicable EPA Guidance Documents

The following guidelines and policy memos published by the EPA were consulted and followed in the process of developing the Northern Ada County PM_{10} Maintenance SIP.

John Calcagni memo of September 4, 1992 on Procedures for Processing Request to Redesignate Areas to Attainment

This policy guidance expands upon each of the five criteria discussed in the previous section under Section 107(d)(3)(E). Rather than repeating that discussion, the following will highlight some of the more relevant discussion from the Calcagni policy memorandum. See Appendix H for full text.

The demonstration that the area has attained the PM_{10} NAAQS involves submittal of ambient air quality data from an ambient air monitoring network representing peak PM_{10} concentrations. The data also should be recorded in the Aerometric Information Retrieval System (AIRS). The area must show that the average annual number of expected exceedances is less than or equal to 1.0. See 40 CFR §50.6. The data must represent the three consecutive years of complete ambient air quality monitoring data collected in accordance with EPA methodologies. The Boise Maintenance SIP meets these criteria. For more specific documentation, please refer to Section 3 and Table 3-3 of this document.

The requirements of the memorandum for Permanent and Enforceable Improvement in Air Quality are discussed in Section 5.2 of this document.

The Calcagni memorandum explains that for redesignation purposes a State must meet all of the applicable Section 110 and Part D planning requirements. EPA reviewed those requirements in determining in that the Northern Ada County PM_{10} SIP revision was approvable on May 30, 1996 (61 FR 27019).

Finally, Section 107(d)(3)(E) of the amended Act stipulates that for an area to be redesignated to attainment, EPA must fully approve a maintenance plan which meets the requirements of Section 175A.

The Calcagni memorandum lists 5 core provisions that are necessary in the Maintenance SIP to ensure maintenance of the NAAQS in the area proposed for redesignation to attainment. As they are discussed and responded to in more detail elsewhere in this document, they are merely listed here for reference.

- Attainment Emissions Inventory
- Demonstration of Maintenance
- Appropriate Monitoring Network
- Verification procedures of Continued Attainment

- Contingency Plan and Measures

The following EPA Guidance documents refer to PM_{10} SIP development and were followed, when appropriate, it developing this Maintenance SIP.

June, 1987 PM_{10} SIP Development Guideline[1]

This document was EPA's initial guidance on developing PM_{10} control programs to attain and maintain the newly promulgated PM_{10} NAAQS. It addressed the transition that States needed to make from the early Total Suspended Particulate SIP control programs to strategies that accounted for PM_{10}. This guidance was used by DEQ in drafting the original PM_{10} SIP for Northern Ada County in 1990, and the October 1991 final SIP submittal. As this guidance was based on the existing, 1977 CAA, more recent guidance and policy memoranda pertaining to the current CAA has made this document of limited value in developing the 2002 Maintenance SIP.

September 23, 1987 Memorandum from J. Craig Porter, Thomas L. Adams Jr., and Francis S. Blake, "Review of State Implementation Plans and Revisions for Enforceability and Legal Sufficiency"[2]

In addition to relative sections of the various Federal CAA [Section 110(a)(2)(A) and Section 172(c)(6)] and regulations in 57 FR 13541, 13556, a key policy memorandum was issues on September 23, 1987 by EPA regarding the enforceability of control measures contained in SIPs. Its focus was on stationary sources and concerned the writing of such control measure implementing regulations to be fully enforceable by the State agencies. With emphasis on involvement by the EPA regional offices prior to SIP submittal, it initiated a greatly expanded effort to review new SIP regulations for enforceability. Extensive guidelines were provided with this policy memorandum.

September, 1994 PM_{10} Emission Inventory Requirements[3]

This document describes the emission inventory requirements that are contained, either explicitly or implicitly, in the 1990 CAA for those areas that are required to submit a State Implementation Plan (SIP) for demonstrating attainment of the National Ambient Air Quality Standard (NAAQS) for PM_{10}. The guidance in this document pertains to PM_{10} to moderate nonattainment areas and to areas that have been reclassified as serious nonattainment areas. The purposes of the document are to (1) identify the types of inventories required; (2) briefly review the regulatory requirements pertaining to submission of these inventories; (3) describe the objectives, components, and ultimate uses of the inventories; and (4) define documentation and reporting requirements for the inventories.

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[1] PM_{10} SIP Development Guideline, U.S. Environmental Protection Agency, Office of air Quality Planning and Standards, Research Triangle Park, N.C. EPA-450/2-86-001, June 1987.

[2] Memorandum from J. Craig Porter, Thomas L. Adams, Jr., and Francis S. Blake to EPA Regional Administrators, Regional Counsels, Air Management Division directors, and Air Branch Chiefs entitled "Review of State Implementation Plans and Revisions for Enforceability and Legal Sufficiency, September 23, 1987.

[3] PM_{10} Emission Inventory Requirements. U.S. Environmental Protection Agency, Research Triangle Park, NC, September 1994.

April, 1999 Emission Inventory Guidance for Implementation of Ozone and Particulate Matter NAAQS[4]

The purpose of this guidance document is to define required elements of emission inventories necessary to meet State Implementation Plan (SIP) requirements for complying with the 8-hour ozone national ambient air quality standard (NAAQS), the revised particulate matter NAAQS and the regional haze regulations. For the particulate matter NAAQS, the emphasis in this guidance is on particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers ($PM_{2.5}$). However, the earlier PM_{10} (particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers) NAAQS are relevant in the Northern Ada County case. The required elements include those for compiling and reporting the emission inventories to the EPA.

2.5 Settlement Agreement between Idaho Clean Air Force et al and U.S. EPA

In 1997, EPA promulgated new particulate matter rules nationwide. These rules were designed to tighten particulate matter standards to better protect public health. With these new rules in place, EPA developed rules and guidance that allowed states to "transition" from the old (pre-existing) PM_{10} standard to the new, assuming an area had three years of clean data and met other specified requirements. At the request of local transportation planners, DEQ chose to pursue the option of adopting the new PM_{10} standards early, and having the non-attainment designation, based on the old standards, revoked. This would mean that transportation conformity would no longer apply for PM_{10} in Ada County, and transportation planning could move forward.

Northern Ada County met the criteria for transition to the new standards, and the state submitted the necessary documentation to EPA to remove the pre-existing standard. The EPA took final action on March 12, 1999, declaring that the pre-existing PM_{10} standard no longer applied to Northern Ada County Idaho. This action also removed Northern Ada County's non-attainment status and transportation conformity requirements.

Soon after declaring that the previous PM_{10} standard no longer applied in Northern Ada County, a U.S. Court of Appeals ruling undermined the basis for EPA's determination on the applicability of the pre-existing PM_{10} standards. The court vacated the revised PM_{10} standard, which had served as the underlining basis for removing the pre-existing standard in Northern Ada County. This left the county with no federal PM_{10} standard in place, although State standards still applied. Northern Ada County became the only area in the nation without a federal PM_{10} standard. It currently has no designation in regards to PM_{0} attainment.

The Idaho Clean Air Force (ICAF), a local community group, with the support of the Environmental Defense Fund (EDF), then sued EPA, and asked the courts to reinstate the pre-existing PM_{10} standard in Ada County. Reinstatement of the standard would likely re-

[4] Emission Inventory Guidance for Implementation of Ozone and Particulate Matter, National Ambient Air Quality Standards (NAAQS) and Regional Haze Regulations and associated memos. U.S. Environmental Protection Agency, Research Triangle Park, NC, April 1999.

institute the non-attainment designation and the associated transportation conformity requirements.

The Department of Environmental Quality and the Community Planning Association of Southwest Idaho (COMPASS) worked with EPA, ICAF and EDF to attempt to reach a settlement agreement. The parties to the lawsuit reached a settlement in January 2001. The settlement required interim measures to insure that PM_{10} standards were protected during the interim period while the DEQ completed a PM_{10} Maintenance Plan. Under court order that Plan must submitted to EPA no later than September 30, 2002. When this Maintenance Plan is approved, Northern Ada County will be designated as attainment for PM_{10}. If any of the conditions of the settlement are not met on time, then the area's PM_{10} designation will revert to non-attainment. As noted earlier, Appendix G contains the complete Settlement Agreement.

2.6 Organization of the Northern Ada County PM_{10} Maintenance SIP

Section 3 discusses the current and proposed PM_{10} air monitoring network in Ada and Canyon counties. Historical data for the daily and annual standards are included. Finally, Section 3 discusses the meteorological conditions and data for the region.

Section 4 summarizes the findings for the 1999 base year, episodes, and projected emission inventories. Motor vehicle emission budgets, which must be used for transportation conformity, are summarized in this section. The full emission inventory and analysis is contained in Appendix A.

Section 5 describes the existing and proposed control measures contained in the Maintenance SIP. Existing measures are included from the 1991 SIP as well as the additional measures approved from the 1994 SIP revisions. The section discusses specific elements of control measures, including Reasonably Available Control Measures (RACMs), Contingency Measures, and the Transportation Conformity Process. Finally, the section expands upon earlier discussion of "permanent and enforceable control measures" as they relate to air quality improvement.

Section 6 is the heart of the Maintenance SIP as it highlights the findings from the air quality modeling effort to support the finding of attainment and future year maintenance of the PM_{10} NAAQS. The modeling portion discusses model and episode selection, model verification, and the actual modeling demonstration results. Appendix B contains the dispersion modeling report and Appendix C the meteorological modeling report. Section 6 also contains supporting evidence of continued air monitoring and attainment verification, protection of the standards from permitting new sources, and a commitment to review and update the Maintenance SIP no later than 2010.

Section 7 identifies the various administrative requirements for Maintenance SIPs and how this plan satisfies those requirements. Commitments to adequate funding, personnel, and legal authority are described in this section.

Finally, Section 8 contains the overall conclusions from the Maintenance Plan development process and request redesignation of Northern Ada County to attainment status for PM_{10}.

3.0 AIR QUALITY

The basis for determining the air quality of any area lies in the collection of accurate and adequate monitoring data. Data collected from an area's monitoring network are used to establish air quality trends, to determine if and when air quality standards are exceeded, and to aid in the development of appropriate air quality control strategies when standards are exceeded. Likewise, local meteorology plays an important role in the area's air quality and meteorological data is extremely important in conducting modeling studies and interpretation of the results.

3.1 Monitoring Network

The Idaho Department of Environmental Quality (DEQ) has monitored PM_{10} at various locations in the Northern Ada County area since 1986. Throughout most of the previous decade, the primary sites were located at Mountain View School, Fire Station #5, Liberty Fire Station, and Meridian. Sites were established for short periods at Bergeson and Cloverdale. The Bergeson site operated during 1991 only before being shut down. The Cloverdale site, established as a background site to the south and west of Boise, operated between 1995 and 1998. In 1993 DEQ also established a monitoring site in Canyon County at the Nampa Fire Station, in the City of Nampa. In 1999, an additional site was established in Boise at Les Bois School. The Liberty Fire Station site was closed in 1999, the Meridian site was closed in 2000, and Fire Station #5 monitors ceased operation in 2001.

The current Ada County monitoring network, as of July 2002, includes the Mountain View and Les Bois sites, with an additional site outside of the county in Nampa. However, the Les Bois site is scheduled to shut down in 2003. Table 3-1 provides information on the sites and operational characteristics for air monitoring in Ada and Canyon counties.

Each monitoring site contains at least one size selective high volume sampler, or PM_{10} Hi-Vol. The PM_{10} Hi-Vol operates by pulling outside air into the sampler and trapping the particulates on a quartz fiber filter. The sampler utilizes a Sierra Anderson size selective air inlet to restrict the size of incoming particles to an aerodynamic diameter smaller than or equal to a nominal 10 micrometers. The airflow into the PM_{10} Hi-Vol is also regulated and measured to determine the total airflow through the sampler, and to control the size of incoming particles, in conjunction with the inlet. The PM_{10} Hi-Vol operates for a 24-hour period from midnight to midnight. The total airflow and the mass of PM_{10} collected on the filters are used to calculate the mass of PM_{10} per volume of air, reported in $\mu g/m^3$.

Tapered Element Oscillating Microbalance (TEOM) monitors provide continuous, real-time (instantaneous) direct measurement of PM_{10} concentrations at the Nampa Fire Station and Fire Station #5 sites. The TEOM at Fire Station #5 was established in 1993, and continues to operate, although the Fire Station #5 Hi-Vol has been shut down. The Nampa TEOM was established in 1999. The operation of the TEOM provides a useful supplement to the official data collected by the PM_{10} Hi-Vols, particularly on days not scheduled for sampling. The simultaneous operation of TEOM and PM_{10} Hi-Vols contribute to establishing a correlation between data collected by the two instruments. The instantaneous data is also used to provide

the public with daily reports on air pollution levels. DEQ is currently developing standard operating and QA/QC procedures for the use of TEOMs in the Idaho air quality monitoring network. Table 3-2 summarizes the monitoring sites and years of operation in the Ada and Canyon county area.

Table 3-1. Current PM_{10} monitoring sites in Ada and Canyon counties (as of July, 2002).

Monitor Location	Monitor Type/Purpose	Operational Period	Operational Schedule
Mountain View School 3500 Carbarton Lane	(residential) NAMS	Started in 1986	1985 – 1988: Every 6th day 1989 – 1997: Winter every other day Summer, every 6th day 1998 – current: Every 3rd day
Les Bois School 4150 E. Grand Forest Dr.	SPM	Started in 1999 Scheduled to shut down January, 2003	Every 6th day
Current monitors outside of former nonattainment area, but within study area:			
Nampa Fire Station 1st Street South, Nampa	SPM	Started in 1993	Every 6th day
Monitors pre-existing in former nonattainment area:			
Fire Station #5 16th and Grove	(downtown) NAMS	Started in 1981 as TSP Changed to PM_{10} in 1985 Ceased operation October, 2001	1989 – 1997: Winter every other day Summer, every 6th day 1998 –Oct, 2001: Every 3rd day
Liberty Fire Station Liberty St. & Fairview Ave.	(commercial) SLAMS	Started in 1972 as TSP Changed to PM_{10} in 1989 Ceased operation in 1999	Every 6th day
Meridian 1516 1st Street, Meridian	(general site, commercial corridor) SLAMS	Started in 1992 Ceased operation in March, 2000	Every 6th day
Cloverdale Cloverdale Rd & Nicholson Rd.	(background) SLAMS	Started in 1995 Ceased operation in July, 1998	Every 6th day
Bergeson 1740 E. Bergeson	(residential) SLAMS	Started in December, 1990 Ceased operation in December, 1991	Every 6th day

Table 3-2. Years monitoring sites were in operation in Northern Ada and Canyon counties (as of July, 2002).

	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02
Mt. View																	
FS #5																	
Liberty																	
Bergeson																	
Meridian																	
Nampa																	
Cloverdale																	
Les Bois																	

3.2 Historical PM_{10} Air Quality Data

Monitoring data are initially collected and reported as 24-hour average values. The daily average values are used to calculated monthly and quarterly averages. The quarterly averages are used to calculate an annual average. PM_{10} air quality standards have been established for 24-hour and annual averages. These standards are set at 150 $\mu g/m^3$ for the 24-hour average, measured from midnight to midnight, and 50 $\mu g/m^3$ for the annual average, based on the calendar year.

Since 1986, seven values exceeding the 24-hour standard have been recorded in the Northern Ada County area. The most recent exceedance was recorded in 1997 at the Cloverdale site. It is believed that this high level was influenced by agricultural activity occurring in close proximity to the monitor, as other sites recorded fairly low levels of particulate matter pollution on this date. The remaining six exceedances were all measured in winter months (January), and were all recorded in 1991 or earlier. Table 3.3 provides the date, value, and location of exceedances of the 24-hour average measured in Northern Ada County. Northern Ada County has exceeded the annual standard of 50 $\mu g/m^3$ only once. This occurred at Fire Station #5 in 1986, prior to the establishment of the annual standard in 1987.
Table 3.4 provides the maximum 24-hour and annual average value recorded at each monitoring site, along with the year the values were recorded.

The maximum PM_{10} concentration measured in Northern Ada County in 2001 was 85 $\mu g/m^3$, measured at Fire Station #5, and 115 $\mu g/m^3$, measured at the Nampa site in Canyon County. The annual arithmetic mean for 2001 was 29.9 $\mu g/m^3$.

Table 3-3. Exceedance values of PM_{10} measured in Northern Ada County.

Date	Value $\mu g/m^3$	Site
Aug. 20 1997	161*	Cloverdale
Jan. 4 1991	152	Mountain View School
Jan. 6 1991	151	Fire Station #5
Jan. 7 1991	173	Fire Station #5
	164	Mountain View School
Jan. 28 1988	165	Fire Station #5
Jan. 14 1986	314	Fire Station #5

* Other sites did not record high levels on this date. Assume due to agricultural activity near site, but still considered valid data by EPA.

Table 3-4. Historical PM_{10} air quality monitoring data in the Ada and Canyon counties.

Monitor	In Operation (PM_{10})	Maximum 24-hour Average ($\mu g/m^3$)	Year Recorded	Maximum Annual Average ($\mu g/m^3$)	Year Recorded
Fire Station #5	1985 – current	314	1986	57.9	1986
Mountain View School	1986 – current	164	1991	39.5	1986
Les Bois School	1999 – current	80	1999	23.9	1999
Nampa Fire Station	1993 – current	131	1996	40.6	1994
Liberty Fire Station	1989 - 1999	140	1991	41.7	1989
Meridian	1992 – 2000	100	1996	32.1	1994
Cloverdale	1995 - 1998	161*	1997	28.7	1995
Bergeson	1990 - 1991	59	1991	23.9	1991

* Other sites did not record high levels on this date. Assume due to agricultural activity near site, but still considered valid data by EPA.

3.3 Summary of Meteorological Data

Boise is situated in the Boise River Valley about 8 miles below the mouth of a mountain canyon where the valley proper begins. Sheltered by large shade trees and averaging 2,710 feet in elevation, the denser part of the city covers a gentle alluvial slope about 2 miles wide, stretching southwest from the foothills of the Boise mountains to the river. The Boise mountains immediately north of the city rise 5,000 to 6,000 feet above sea level, with the slopes partly mantled with sagebrush and then chaparral giving way near the summit to ridges of fir, spruce, and pine. Across the river, the land rises in two irregular steps, or benches, for several miles, finally reaching the low divide between the Boise and Snake Rivers. Downstream the valley widens, merging with the valley of the Snake about 40 miles to the northwest. Once semi-arid, the entire area is now irrigated from the upstream reservoirs.

Meteorology is a very important factor in studying the conditions that led to exceedances of the PM_{10} standard in Northern Ada County during the late 1980s and early 1990s. Although air masses from the Pacific are considerably modified by the time they reach Boise, their influence, particularly in winter, alternates with that of atmospheric developments from other directions. The result is almost a typical upland continental type of climate in summer, while

winters are usually tempered by periods of cloudy or stormy and mild weather. Autumns have prolonged periods of near ideal weather, while springtime is noted by changeable weather and varied temperatures. The Boise climate in general may be described as dry and temperate, with some variation. Summer hot periods rarely last longer than a few days. Temperatures of 100 degrees or higher occur nearly every year. Winter cold spells with temperatures of 10 degrees or lower generally last longer than the summer hot spells. During cold weather, however, there is ordinarily little wind. The normal precipitation pattern in the Boise area shows a winter high and a very pronounced summer low. Total amounts and intensity are generally greatest near the foothills, dwindling to westward and southward.

The area is located in a depression in a broad mountainside valley. High PM_{10} levels usually occur in cold, stagnant periods due to very light geographically induced drainage as the cool air typically pools up in the valley floor between the passages of strong weather systems. With only 11 inches of precipitation annually, these periods between fronts can be of extended duration. Deep stable layers (defined as inversion conditions especially conductive to pollutant buildup) occur more often than in the other intermountain valley cities studied by Wolyn and McKee (1989). The extended stagnant weather conditions during winter season may severely restrict the exchange of air in and out of the valley. As frigid air enters the air shed following the passage of a cold front, a shallow inversion is created in the basin and emissions are trapped near the surface. This cold, emission filled air mass stabilized as warm air aloft moves over the region. Multiple day stagnation events of this type can potentially lead to the buildup of PM_{10} concentration in the area. For example, an exceedance of 314 $\mu g/m^3$ was measured in downtown Boise during the intense air stagnation episode in January 1986.

Table 6-1 in Section 6.1.2 of this SIP provides more details on recent meteorological data in relation to the episodes of 1986, 1988, and 1991. The Dispersion Modeling report, found in Appendix B, and the Meteorological Modeling Report, Appendix C, provides added details of the meteorology during the time of these episodic conditions.

4.0 EMISSION INVENTORY

Detailed emission inventories for all sources in Ada and Canyon counties were developed for both episodic and annual air quality modeling. These emission inventories were developed for direct emissions of PM_{10}, and for PM_{10} precursors – nitrogen oxides (NO_x), sulfur oxides (SO_x), volatile organic compounds (VOCs), carbon monoxide (CO), and ammonia (NH_3). Annual emissions were estimated for the 1999 base year, and for three future years – 2010, 2015, and 2020. Episodic emission inventories were developed using meteorological data from historical worst-case episodes. The 1999 episode was for the seven-day period December 20 through December 26. For future year air quality modeling, emissions were projected to the future years using meteorology from the worst-case episode that occurred during the nine-day period January 1-9, 1991.

The emission inventories were developed according to the methodologies and quality assurance/quality control (QA/QC) procedures documented in *Final Inventory Preparation Plan/Quality Assurance Plan* (IPP/QAP), prepared for the DEQ, July 17, 2001. The IPP/QAP is based on U.S. EPA methods, such as those published in *Compilation of Air Pollutant Emission Factors, Volume I (AP-42), Fifth Edition* (U.S. EPA, January, 1995) and guidelines of the Emission Inventory Improvement Program (EIIP). Full details of the emission inventory development and results are provided in Appendix A.

The emission inventories consist of four major source categories. These categories, and the approach used to estimate emissions in each, are as follows:

Point Sources

Point sources are major stationary sources, defined as all facilities emitting greater than five tons per year (tpy) PM_{10} from a single stack. Point source emissions include combustion emissions, process emissions, material transfers, pile wind erosion, and paved and unpaved roads within facility grounds. Point source emissions for the base year were estimated based on data submitted to DEQ in response to a Point Source Questionnaire (PSQ) that was sent to approximately 160 facilities in Ada and Canyon counties. Emissions for the 1999 base year are based on *actual* operating conditions. Future year point source emissions are estimated maximum *potential to emit* (PTE), calculated using maximum design capacities for each source. PTE was determined from either (a) permit limits established by DEQ, or (b) by calculating maximum possible emissions as determined by the emission sources' operating design capacities or by assuming continuous operation (i.e., 365 days per year).

Area Sources

Area sources are defined as all stationary sources (both anthropogenic and non-anthropogenic) that are not included in the point source inventory. These numerous facilities and activities include residential wood combustion, open burning, agricultural activities, other fugitive dust, biogenic emissions, and VOC sources such as solvent usage. Most area source emissions were estimated using the general methodology of combining an EPA emission factor with appropriate activity data (e.g., fuel consumed, number of employees in a particular industry). Local activity data were used for emission estimation where available.

On-Road Mobile Sources

The category of on-road mobile source emissions includes emissions from vehicles certified for highway use (cars, trucks, and motorcycles), and also fugitive road dust from paved and unpaved roads. Vehicular emissions were estimated using EPA emission factor models MOBILE6 and PART5, combined with vehicle activity (vehicle miles traveled, VMT) from COMPASS transportation modeling. On-road emissions were estimated for each roadway segment in the COMPASS transportation network. Fugitive dust from paved and unpaved roads was estimated using local data from the Treasure Valley Road Dust Study, conducted in 2001 by the Desert Research Institute (Etymezian et al., 2002)[1].

Off-Road Mobile Sources

Off-road mobile sources include equipment in the nine categories: agricultural, aircraft, airport ground support, construction and mining, industrial and commercial, lawn and garden, locomotives, recreational, and pleasure craft. Most off-road emissions were estimated using EPA's latest draft NONROAD model using local activity data where available. Aircraft and locomotive emissions (not included in the NONROAD model) were estimated using EPA approved methods.

All the tables and figures referred to in the following narrative discussion are found at the end of this Chapter.

4.1 1999 Base Year Annual and Episode Emission Inventories

Table 4-1 shows the 1999 base year annual emission inventories for Ada and Canyon counties combined; Figure 4-1 shows the relative contribution of each of the four major source categories to the total emissions for each pollutant. Annual PM_{10} emissions are primarily from fugitive road dust and agricultural activities. NO_X emissions are primarily from on-road and off-road mobile sources. Industrial point sources account for about half of the SO_X emissions, and on-road and non-road mobile sources account for most of the remainder. Livestock is the dominant source of ammonia emissions (about 75%, details provided in Appendix A). About 70 percent of the VOC emissions are from area sources, with most of the remainder from mobile sources. CO is almost completely from on-road and off-road mobile sources.

Table 4-2 shows the emissions for the highest concentration day in the 1999 episode – December 24; the relative contributions by major source category are shown in Figure 4-2. For industrial point sources the emissions are actual emissions as reported by the point sources in the Point Source Questionnaire. For area, on-road mobile, and off-road mobile sources, seasonal and weekday/weekend adjustment factors were used to generate the daily emission inventories for each day of the 1999 episode. December 24, 1999, though a Friday, was treated as a weekend day because it is a holiday and activity was thought to be more typical of

[1] Etymezian V., Kuhns, H., Gillies, J. Green, M. Chow, J., Kohl, S., Watson, J. 2002, Treasure Valley road dust study final report. Prepared for the Idaho Department of Environmental Quality, Boise, ID by the Desert Research Institute, Las Vegas, NV.

weekends than weekdays. Open burning was zeroed out in the episodic emission inventories as such activity was virtually nonexistent during the winter.

On the December 24, 1999 episode day, almost 90 percent of the PM_{10} emissions are from fugitive road dust, and about 7 percent of the emissions are from residential wood combustion. NO_X emissions are dominated by mobile sources (54 percent from on-road and 16 percent from off-road), with point sources accounting for 18 percent and area sources (mostly fuel combustion) accounting for the remaining 12 percent. Industrial point sources account for 80 percent of the SO_X emissions, with the remainder from mobile sources. As for the annual emissions, livestock is the dominant source of ammonia emissions. The largest source category for VOC emissions is residential wood combustion (42 percent), with other area sources (mostly solvent usage) accounting for 18 percent, and mobile sources accounting for 31 percent. CO emissions are dominated by mobile sources (64 percent on-road and 18 percent off-road mobile), with the remainder from residential and other fuel combustion.

4.2 Projected Inventories

Emission inventories for the three future years were estimated using different approaches for each of the four major emissions inventory categories. Industrial point source emissions for future years were estimated as maximum allowable, calculated using maximum design capacities for each source, or permitted limits. Thus projected point source emissions are the same for all three future years, and are significantly higher than 1999 actual point source emissions. Based on historical operations, we expect that projected point source emissions will likely be less than currently permitted levels. In addition, actual future year emissions including growth in point source emissions not accounted for (i.e., new point sources) should be significantly less than these emissions projections based on PTE levels for all facilities.

For area sources, future year emissions were estimated by first applying growth factors to the 1999 base year emissions using data such as population, number of households, livestock population, etc. Control factors were then applied using data such as anticipated number of voluntary and mandatory burn bans days applicable to residential wood combustion, and regulatory VOC reductions. This data was contained in the October 1991 Northern Ada County/Boise Particulate (PM_{10}) Air Quality Improvement Plan, i.e., SIP.

For on-road mobile sources, the effects of Federal motor vehicle program controls are incorporated into the MOBILE6[2] and PART5[3] emission factor models, and the COMPASS transportation modeling system was used to estimate vehicle miles traveled for roadway segment in each of the future years.

[2] MOBILE6 includes the effects of promulgated regulations with future effective dates such as the 2007 heavy-duty diesel vehicle (HDDV) standards.

[3] PART5 does not incorporate the effects of the 2007 HDDV standards with low sulfur diesel, and so overestimates HDDV PM and SO_2. Nor does it incorporate the effects of the Tier 2 light-duty vehicle and low-sulfur gasoline regulations, and so overestimates light-duty SO_2. Per discussion with EPA's Office of Transportation and Air Quality Modeling, the model was used as is without adjustment because the effect on the overall inventory would be small.

Future year emissions for non-road mobile sources were estimated using EPA's NONROAD model, which incorporates the effects of all current Federal control programs for off-road sources. Local growth factors were used instead of the model's default national level growth factors.

Table 4-3 shows the main growth factors used in estimating future year emissions for area, on-road mobile, and off-road mobile sources; these data were provided by COMPASS. Population and households are forecast to grow over the next 20 years at a rate of about 2.7 percent per year in Ada County and about 2.3 percent per year in Canyon County. Overall employment is forecast to grow at similar rates as population, with retail employment projected to increase at the fastest rate.

Annual emission inventories for the three future years are in Tables 4-4 through 4-6; Figure 4-3 shows the relative contribution by major source category to the 2015 annual emissions. The largest change in comparison to the 1999 annual emissions in Table 4.1 is for point sources; as explained above, the future year point source emissions are PTE levels, while the base year emissions are actual levels. Area sources and non-road emissions increase slightly, corresponding to the growth factors in Table 4-3. On-road emissions for criteria pollutants (NO_X, VOC, and CO) decrease in future years despite VMT growth, as fleet turnover introduces more new vehicles that meet tighter emissions standards. On-road emissions for PM_{10} and SO_X though, increase, as predicted by the current (outdated) PART5 model.

Episodic emission inventories corresponding to the meteorology on the highest observed concentration day in the January 7, 1991 episode are shown in Tables 4-7 through 4-9 for years 2010, 2015, and 2020, respectively; Figure 4-4 shows the relative contribution by major source category for the 2015 episode. These are the controlled emission inventories used in the dispersion modeling. Appendix A describes in detail how the episodic emission inventories were generated. There are four factors that result in large differences between the base and future year episodic emission inventories:

Episodic point source emissions are PTE levels in the future years and actual emissions in the base year.

December 24 in the base year is modeled as a weekend day; while January 7 in the future years is modeled as a weekday. For most emission sources, weekday activity levels and thus emissions are higher on weekdays than on weekends.

As explained in the dispersion modeling report (Appendix C) a voluntary burn ban in Ada County was imposed for the future year modeling; this ban results in significant reduction in emissions from residential wood combustion.

Also as explained in the dispersion modeling report, road dust emissions were reduced because there was 7 inches of snow cover on the ground.

In the future year episodic emission inventories, fugitive road dust is still the dominant source of PM_{10} emissions, with most of the remainder attributed to point sources. NO_X emissions are largely from point sources at their PTE levels, with on-road and off-road mobile sources also contributing significantly. SO_X emissions in the future year episodic inventories are

completely dominated by point sources. The distribution of VOC and CO emissions are similar to the 1999 episode inventories.

4.3 Motor Vehicle Emission Budgets

4.3.1 Requirements

The PM_{10} Maintenance Plan must identify regional, not-to-be-exceeded limits on PM_{10} emissions and, if significant as precursors, VOC and NO_X emissions that are allowed from on-road mobile sources. These budgets are described in this Section. The budgets apply to the *former* Ada County PM_{10} Non-attainment area, which was described previously in Section 2.

Under Section 176(c) of the CAA, transportation plans, programs, and projects in maintenance areas that are funded or approved under 23 U.S.C. or the Federal Transit Act, must conform to the on-road motor vehicle emissions budgets (MVEB) specified in the applicable SIP. Federal transportation conformity regulations are found in 40 CFR Part 93, subpart T – Conformity to State or Federal Implementation Plans of Transportation Plans, Programs, and Projects Developed, Funded or Approved Under Title 23 U.S.C. or the Federal Transit Laws. Part 93, subpart A of this chapter was revised by the EPA in the August 15, 1997 Federal Register. Section 93.102(b)(2)(iii) of that revised regulation identifies NO_X and VOC as the two PM_{10} precursor pollutants that must also have a MVEB if deemed significant. This is the case in Northern Ada County. The conformity rule does not require sulfur oxides or ammonia to be addressed; however, they were inventoried in the Maintenance Plan, and were found to consist of 1.9% and 0.7% of the total Motor Vehicle emissions (See Table 4-10) for Northern Ada County which has been deemed insignificant. Finally, Section 93.124 (c) prohibits trading emissions among different pollutants or source categories in conformity determinations unless the SIP specifically establishes a trading mechanism. The Northern Ada County PM_{10} Maintenance SIP does not establish such a mechanism.

4.3.2 MVEB for PM_{10}

The MVEB for PM_{10} is comprised of the fugitive dust from paved and unpaved roads, and the vehicle emissions (exhaust, tire wear, and brake wear). Construction emissions from on-road mobile sources were determined not to be significant and therefore are not included in the MVEB for Northern Ada County for future conformity purposes. The MVEB applies after the EPA has determined the budget adequate. While Section 93.118 (b)(2) requires, at a minimum, the MVEB to be applicable for the last year of the maintenance plan (2015), DEQ has chosen to set a PM_{10} MVEB for 1999 and 2010 as well as 2015. DEQ conducted a modeling analysis for 1999, 2010, and 2015 and found that the PM_{10} standard was protected in each of these years with the selected PM_{10} MVEB.

Extensive consultation has occurred during the development of the conformity MVEB. In-person and conference call meetings involving EPA-Region 10 planning and conformity experts, FHWA, COMPASS, DEQ, and the consultants occurred during the development of the draft PM_{10} SIP MVEB and in making the revisions based on the public hearing and written comments. Concerns on the draft MVEB, raised by EPA during the comment period, were

fully responded to and included in this revised, final Maintenance SIP for Northern Ada County.

Section 175A of the Clean Air Act indicates that the maintenance plan must demonstrate that the NAAQS is maintained at least ten years after the area is officially redesignated to attainment by EPA. EPA guidance regarding maintenance plans (EPA Memorandum re: Procedures for Processing Requests to Redesignate Areas to Attainment, September 4, 1992) (Appendix H of this document) indicates that it should be assumed that it will take 18 months to approve a redesignation request. As a result, the guidance states the maintenance demonstration should be modeled for "at least 12 years" from the submittal date.

The regional modeling demonstrates maintenance of the annual average standard and the 24-hour standard in 2015 (Appendix B). The projections in the modeling indicated that the average daily PM_{10} emissions in 2015 for all sources in Northern Ada County would be 102.3 tpd. For conformity purposes, motor vehicle emissions include regional reentrained dust from travel on paved roads, vehicular exhaust, and travel on unpaved roads; for 2015 the total for these activities is 75.8 tons per day.

EPA regulations [Section 93.124 (a) of the August 15, 1997 Federal Register] provide for a "margin of safety" if it can be demonstrated that a higher MVEB will still provide for maintenance of the standard even when included in the future year maintenance budget. The purpose of this safety margin is to account for the longer time frames required by Federal transportation law in adopting Regional Transportation Plans. Emissions resulting from the RTP must be estimated for a minimum 20-year planning horizon. Furthermore, potential changes in Federal law ("TEA 3") may change the timeframe for transportation plan updates and thus result in even longer planning horizons for conformity purposes.

Following EPA guidance noted previously, an approximate 33% safety margin was included in an annual rollback model run of the 2015 maintenance demonstration to ensure that maintenance of the standard could still be demonstrated with increased motor vehicle emissions for PM_{10}. The process involved increasing the Northern Ada County motor vehicle emissions for PM_{10} of 27,674 tpy or 75.8 tpd (See Table 4-10) by 24.2 tpd (33% safety margin). This resulted in a 2015 MVEB for Northern Ada County of 36,507 tpy or 100 tons per day. The 2015 motor vehicle emissions plus the safety margin was then re-run.[4] The results of that model run showed that the maintenance of the standard could still be demonstrated in 2015, as the annual standard would be 42.6 $\mu g/m^3$ (Appendix E, Section 6.1). Therefore, a safety margin of 24.2 tpd is being established to provide a PM_{10} motor vehicle emissions budget of 100 tpd.

4.3.3 MVEB for NO_X and VOC

Section 93.118(b)(2) of the conformity rule requires that an emissions budget be established for the last year of the maintenance plan (which is documented above). The rule also allows for the maintenance plan to establish budgets for any other years. Accordingly, the DEQ is establishing NOx and VOC emission budgets for the base year, 1999, including a 10% margin of safety. Episodic and annual modeling analyses with these 1999 MVEBs through 2010

[4] The rollback model was performed for Ada and Canyon counties combined.

demonstrated that the PM_{10} standard was protected (Appendix J, Sections J.2 and J.3, respectively). An additional MOBILE6 modeling run for the winter episode emissions from 1999 to 2010 was conducted and it found that the emission factors for NO_X and VOC were decreasing at a faster rate than Ada County VMT was increasing (Appendix J, Section J.1.2). Therefore, the motor vehicle emissions for NO_X and VOC in the base year 1999, with a 10% margin of safety will apply as the MVEB until 2010. This interim 1999 MVEB for NOx is 21.0 tpd, and for VOC is 10.4 tpd.

In 2010, these interim MVEBs for NOx and VOC will terminate and a new interim MVEB for those two pollutants will go into effect. This budget is based on motor vehicle emissions as projected for 2010 in Table 4-10. No safety margin was deemed necessary for this new interim MVEB. This interim MVEB from 2010 through 2014 for NO_X is 11.2 tpd, and for VOC is 6.1 tpd. Finally, the MVEB for the maintenance year of 2015, and beyond, is 7.8 tpd for NO_X and 5.0 tpd for VOC.

The DEQ has calculated that these budgets will enable the Maintenance Area to show transportation plan and program conformity for PM_{10} successfully throughout the maintenance period.

4.3.4 Summary and Conclusions

The table below provides a summary of the MVEBs for Northern Ada County by pollutant and year. Supporting information that confirms continued maintenance of the annual PM_{10} standard beyond 2015 with these budgets is contained in Appendix E, Section 6.1. Likewise, supporting information that demonstrates protection of the episodic and annual PM_{10} standards during the 1999-2010 period, based on a NO_X and VOC MVEB for 1999 that is higher than the 2010 MVEB respectively, is contained in Appendix J, Sections J.2 and J.3, respectively.

Year	PM_{10} (tpd)	NO_X (tpd)	VOC (tpd)
1999	100.0	21.0	10.4
2010	100.0	11.2	6.1
2015	100.0	7.8	5.0

In accordance with the conformity rule, the emissions budget applies as a ceiling on emissions in the year for which it is defined, and for all subsequent years until another year for which a different budget is defined or until a SIP revision modifies the budget. Thus, the 1999 MVEB will apply for any conformity horizon year through 2009, and the 2010 MVEB will apply for any conformity horizon year from 2010 through 2014, and the 2015 for all subsequent years.

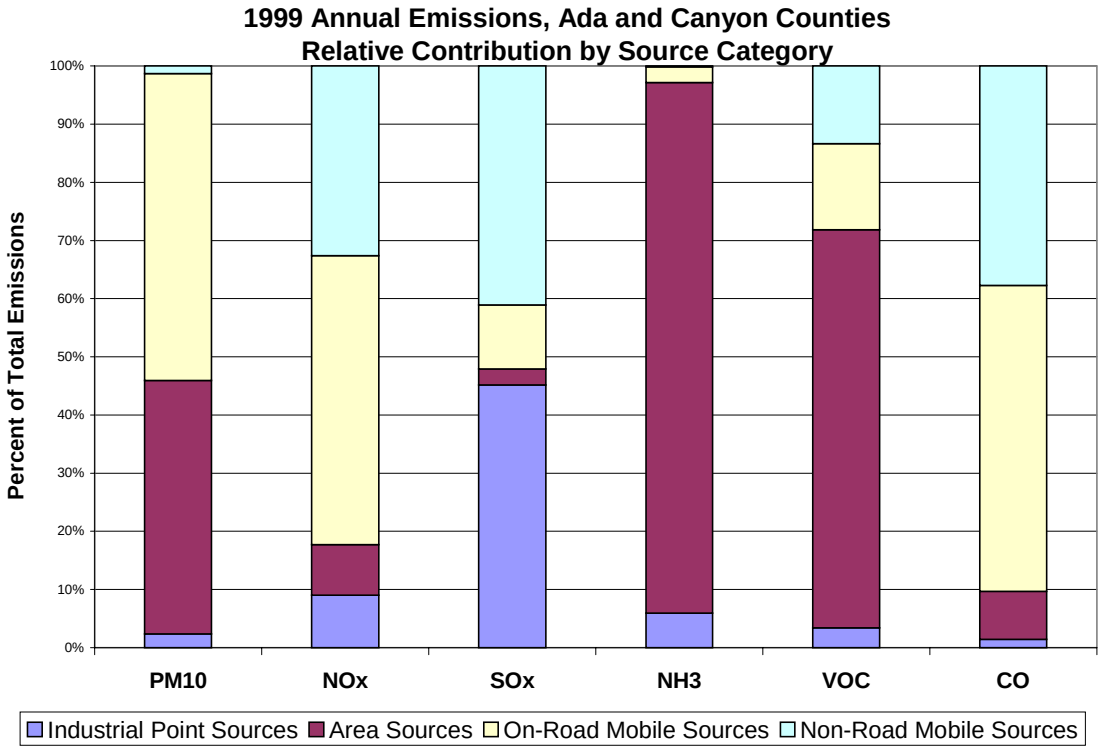

Figure 4-1. Relative contribution in 1999 of major source categories to total emissions of each pollutant.

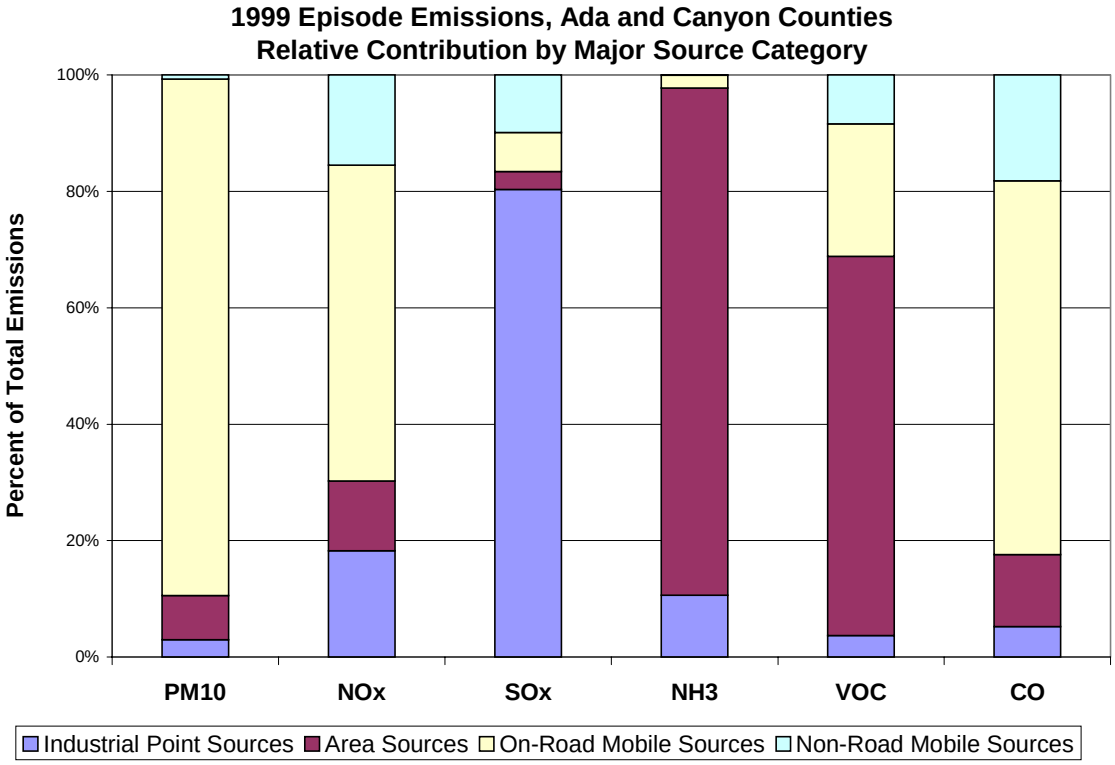

Figure 4-2. Relative emissions contribution during the December 24, 1999 episode day by major sources categories.

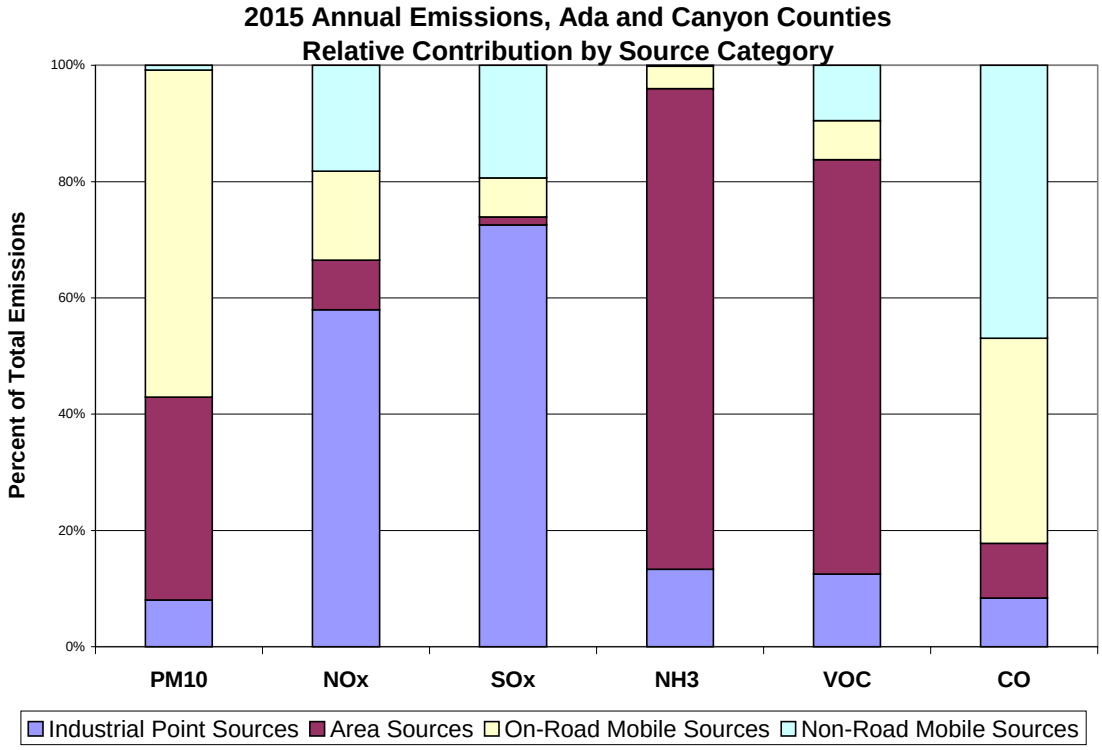

Figure 4-3. Relative contribution in 2015 of major source categories to total emissions of each pollutant.

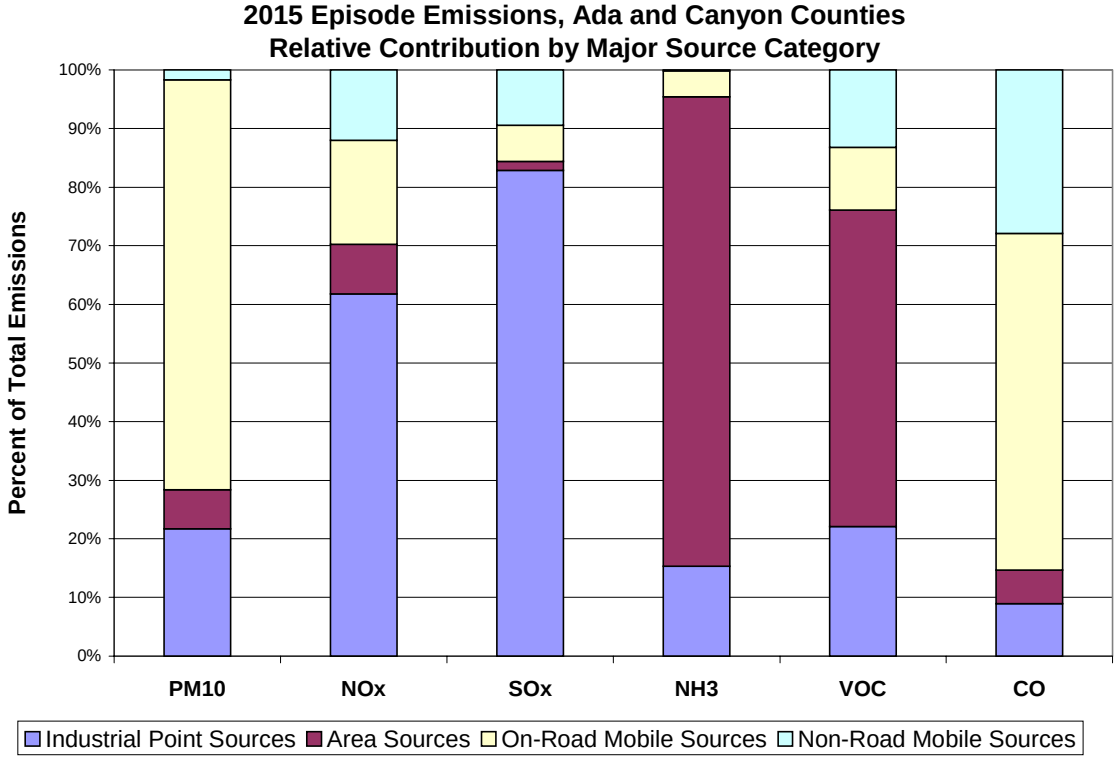

Figure 4-4. Relative emissions contribution for the 2015 episode by major sources categories.

Table 4–1. 1999 annual emission inventories, Ada and Canyon counties combined.

	PM_{10}		NOx		SOx		NH3		VOC		CO	
Source Category	tons/year	% of total	tons/year	% of total	tons/year	% of total	tons/year	% of total	tons/year	% of total	tons/year	% of total
Industrial Point Sources	1,173	2.3%	1,796	9.0%	1,715	45.2%	405	5.9%	1,164	3.4%	1,984	1.4%
Area Sources	21,775	43.6%	1,734	8.7%	103	2.7%	6,260	91.3%	23,313	68.4%	11,798	8.3%
Residential Wood Combustion	526	1.1%	48	0.2%	7	0.2%	0	0.0%	2,209	6.5%	3,831	2.7%
Other Fuel Combustion	147	0.3%	871	4.4%	61	1.6%	7	0.1%	41	0.1%	482	0.3%
Open Burning	2,094	4.2%	254	1.3%	35	0.9%	0	0.0%	1,754	5.1%	7,485	5.2%
Agricultural Activities	15,746	31.5%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Other Fugitive Dust	3,262	6.5%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Ammonia sources	0	0.0%	0	0.0%	0	0.0%	6,253	91.2%	0	0.0%	0	0.0%
Biogenic Emissions	0	0.0%	561	2.8%	0	0.0%	0	0.0%	11,090	32.5%	0	0.0%
VOC Sources	0	0.0%	0	0.0%	0	0.0%	0	0.0%	8,219	24.1%	0	0.0%
On-Road Mobile Sources	26,357	52.8%	9,932	49.7%	418	11.0%	184	2.7%	5,052	14.8%	75,303	52.7%
Vehicle Emissions (Exhaust, Tire Wear, & Brake Wear)	382	0.8%	9,932	49.7%	418	11.0%	184	2.7%	5,052	14.8%	75,303	52.7%
Fugitive Road Dust	25,975	52.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Non-Road Mobile Sources	635	1.3%	6,505	32.6%	1,559	41.1%	10	0.1%	4,545	13.3%	53,899	37.7%
Aircraft	12	0.0%	154	0.8%	19	0.5%	0	0.0%	320	0.9%	6,015	4.2%
Airport Ground Support Equipment	5	0.0%	88	0.4%	13	0.3%	0	0.0%	108	0.3%	2,071	1.4%
Lawn & Garden Equipment	110	0.2%	470	2.4%	100	2.6%	1	0.0%	2,555	7.5%	28,008	19.6%
Recreational Equipment	4	0.0%	25	0.1%	5	0.1%	0	0.0%	179	0.5%	2,376	1.7%
Commercial and Industrial Equipment	101	0.2%	1,103	5.5%	269	7.1%	3	0.0%	475	1.4%	10,831	7.6%
Construction and Mining Equipment	213	0.4%	1,903	9.5%	591	15.6%	2	0.0%	367	1.1%	2,383	1.7%
Agricultural Equipment	164	0.3%	2,062	10.3%	492	13.0%	2	0.0%	327	1.0%	1,685	1.2%
Recreational Marine Vessels	8	0.0%	14	0.1%	5	0.1%	0	0.0%	186	0.5%	451	0.3%
Locomotives and Railroad Equipment	18	0.0%	686	3.4%	65	1.7%	0	0.0%	30	0.1%	79	0.1%
TOTAL	49,939		19,967		3,795		6,859		34,074		142,984	

Table 4-2. 1999 episode emission inventories, Ada and Canyon Counties combined. Emissions are for the highest concentration day (Friday, Dec. 24)

	PM10		NOx		SOx		NH3		VOC		CO	
Source Category	tons/day	% of total	tons/day	% of total	tons/day	% of total	tons/day	% of total	tons/day	% of total	tons/day	% of total
Industrial Point Sources	2.19	3.0%	7.38	18.3%	10.01	80.3%	1.77	10.6%	1.94	3.7%	16.70	5.3%
Area Sources	5.60	7.6%	4.83	12.0%	0.38	3.0%	14.48	87.1%	33.97	65.1%	39.25	12.4%
Residential Wood Combustion	5.06	6.9%	0.46	1.1%	0.07	0.6%	0.00	0.0%	21.71	41.6%	36.88	11.6%
Other Fuel Combustion	0.52	0.7%	3.69	9.1%	0.31	2.5%	0.03	0.2%	0.19	0.4%	2.32	0.7%
Open Burning	0.02	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.01	0.0%	0.05	0.0%
Agricultural Activities	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%
Other Fugitive Dust	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%
Ammonia sources	0.00	0.0%	0.00	0.0%	0.00	0.0%	14.45	86.9%	0.00	0.0%	0.00	0.0%
Biogenic Emissions	0.00	0.0%	0.67	1.7%	0.00	0.0%	0.00	0.0%	2.87	5.5%	0.00	0.0%
VOC Sources	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	9.19	17.6%	0.00	0.0%
On-Road Mobile Sources	65.43	88.7%	21.90	54.3%	0.84	6.7%	0.37	2.2%	11.87	22.8%	203.57	64.2%
Vehicle Emissions (Exhaust, Tire Wear, & Brake Wear)	0.41	0.6%	21.90	54.3%	0.84	6.7%	0.37	2.2%	11.87	22.8%	203.57	64.2%
Fugitive Road Dust	65.02	88.2%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%
Non-Road Mobile Sources	0.51	0.7%	6.26	15.5%	1.24	9.9%	0.01	0.1%	4.39	8.4%	57.80	18.2%
Aircraft	0.03	0.0%	0.42	1.0%	0.05	0.4%	0.00	0.0%	0.88	1.7%	16.48	5.2%
Airport Ground Support Equipment	0.01	0.0%	0.27	0.7%	0.01	0.1%	0.00	0.0%	0.30	0.6%	5.54	1.7%
Lawn & Garden Equipment	0.06	0.1%	0.21	0.5%	0.04	0.3%	0.00	0.0%	1.54	3.0%	13.54	4.3%
Recreational Equipment	0.01	0.0%	0.05	0.1%	0.01	0.1%	0.00	0.0%	0.32	0.6%	4.09	1.3%
Commercial and Industrial Equipment	0.16	0.2%	1.62	4.0%	0.44	3.5%	0.00	0.0%	0.74	1.4%	15.59	4.9%
Construction and Mining Equipment	0.12	0.2%	1.11	2.7%	0.35	2.8%	0.00	0.0%	0.21	0.4%	1.37	0.4%
Agricultural Equipment	0.05	0.1%	0.69	1.7%	0.17	1.3%	0.00	0.0%	0.12	0.2%	0.54	0.2%
Recreational Marine Vessels	0.01	0.0%	0.02	0.0%	0.00	0.0%	0.00	0.0%	0.19	0.4%	0.46	0.1%
Locomotives and Railroad Equipment	0.05	0.1%	1.87	4.6%	0.17	1.4%	0.00	0.0%	0.08	0.2%	0.20	0.1%
TOTAL	73.74		40.36		12.46		16.62		52.16		317.32	

Table 4-3. Growth factors used in future year emission inventory projections.

	Ada County				Canyon County			
Growth Factor	2000	2010	2015	2020	2000	2010	2015	2020
Population	300,904	402,500	455,171	466,403	131,441	167,416	181,313	192,738
Households	113,408	150,691	170,170	174,321	45,018	57,435	62,343	66,355
Vehicle Miles Traveled	6,360,595	8,751,299	10,159,034	11,669,886	2,416,967	3,193,374	3,625,893	4,138,348
Retail Employment	37,708	53,594	60,856	62,419	9,776	12,007	13,125	15,799
Office Employment	92,616	113,670	123,462	135,550	12,423	16,491	18,530	20,581
Industrial Employment	41,546	54,507	60,539	67,965	15,609	17,395	18,294	19,191
Government Employment	27,151	34,166	37,434	41,457	5,487	6,249	6,631	7,011
Agriculture	0	0	0	0	2,033	1,914	1,858	1,798

Table 4–4. 2010 annual emission inventories, Ada and Canyon counties combined.

	PM_{10}		NOx		SOx		NH3		VOC		CO	
Source Category	tons/year	% of total	tons/year	% of total	tons/year	% of total	tons/year	% of total	tons/year	% of total	tons/year	% of total
Industrial Point Sources	5,279	8.6%	14,937	53.8%	7,280	74.3%	1,007	13.4%	4,754	12.9%	13,207	8.7%
Area Sources	22,582	36.8%	2,036	7.3%	125	1.3%	6,236	83.1%	25,629	69.4%	13,705	9.1%
Residential Wood Combustion	643	1.0%	59	0.2%	9	0.1%	0	0.0%	2,710	7.3%	4,687	3.1%
Other Fuel Combustion	196	0.3%	1,105	4.0%	72	0.7%	9	0.1%	51	0.1%	607	0.4%
Open Burning	2,505	4.1%	311	1.1%	44	0.5%	0	0.0%	2,075	5.6%	8,412	5.6%
Agricultural Activities	15,318	25.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Other Fugitive Dust	3,920	6.4%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Ammonia sources	0	0.0%	0	0.0%	0	0.0%	6,228	83.0%	0	0.0%	0	0.0%
Biogenic Emissions	0	0.0%	561	2.0%	0	0.0%	0	0.0%	11,090	30.0%	0	0.0%
VOC Sources	0	0.0%	0	0.0%	0	0.0%	0	0.0%	9,703	26.3%	0	0.0%
On-Road Mobile Sources	32,892	53.7%	5,703	20.5%	581	5.9%	251	3.3%	3,085	8.3%	57,188	37.8%
Vehicle Emissions (Exhaust, Tire Wear, & Brake Wear)	410	0.7%	5,703	20.5%	581	5.9%	251	3.3%	3,085	8.3%	57,188	37.8%
Fugitive Road Dust	32,483	53.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Non-Road Mobile Sources	543	0.9%	5,085	18.3%	1,813	18.5%	12	0.2%	3,484	9.4%	67,177	44.4%
Aircraft	16	0.0%	189	0.7%	22	0.2%	0	0.0%	342	0.9%	6,232	4.1%
Airport Ground Support Equipment	4	0.0%	94	0.3%	12	0.1%	0	0.0%	133	0.4%	2,633	1.7%
Lawn & Garden Equipment	119	0.2%	443	1.6%	106	1.1%	2	0.0%	1,928	5.2%	36,691	24.3%
Recreational Equipment	4	0.0%	24	0.1%	3	0.0%	0	0.0%	225	0.6%	3,253	2.2%
Commercial and Industrial Equipment	110	0.2%	1,120	4.0%	367	3.7%	4	0.1%	326	0.9%	13,807	9.1%
Construction and Mining Equipment	152	0.2%	1,298	4.7%	751	7.7%	3	0.0%	176	0.5%	2,402	1.6%
Agricultural Equipment	112	0.2%	1,214	4.4%	483	4.9%	2	0.0%	166	0.4%	1,536	1.0%
Recreational Marine Vessels	8	0.0%	19	0.1%	4	0.0%	0	0.0%	160	0.4%	546	0.4%
Locomotives and Railroad Equipment	17	0.0%	684	2.5%	65	0.7%	0	0.0%	29	0.1%	78	0.1%
TOTAL	61,297		27,762		9,799		7,506		36,952		151,276	

Table 4–5. 2015 annual emission inventories, Ada and Canyon counties combined.

	PM_{10}		NOx		SOx		NH3		VOC		CO	
Source Category	tons/year	% of total	tons/year	% of total	tons/year	% of total	tons/year	% of total	tons/year	% of total	tons/year	% of total
Industrial Point Sources	5,279	8.0%	14,937	57.9%	7,280	72.6%	1,007	13.4%	4,754	12.5%	13,207	8.4%
Area Sources	22,988	34.9%	2,201	8.5%	139	1.4%	6,224	82.6%	27,100	71.3%	14,882	9.4%
Residential Wood Combustion	717	1.1%	66	0.3%	10	0.1%	0	0.0%	3,028	8.0%	5,225	3.3%
Other Fuel Combustion	218	0.3%	1,229	4.8%	79	0.8%	10	0.1%	57	0.2%	672	0.4%
Open Burning	2,757	4.2%	345	1.3%	50	0.5%	0	0.0%	2,271	6.0%	8,984	5.7%
Agricultural Activities	15,104	22.9%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Other Fugitive Dust	4,192	6.4%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Ammonia sources	0	0.0%	0	0.0%	0	0.0%	6,215	82.5%	0	0.0%	0	0.0%
Biogenic Emissions	0	0.0%	561	2.2%	0	0.0%	0	0.0%	11,090	29.2%	0	0.0%
VOC Sources	0	0.0%	0	0.0%	0	0.0%	0	0.0%	10,654	28.0%	0	0.0%
On-Road Mobile Sources	36,996	56.2%	3,957	15.3%	675	6.7%	289	3.8%	2,547	6.7%	55,640	35.3%
Vehicle Emissions (Exhaust, Tire Wear, & Brake Wear)	462	0.7%	3,957	15.3%	675	6.7%	289	3.8%	2,547	6.7%	55,640	35.3%
Fugitive Road Dust	36,533	55.5%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Non-Road Mobile Sources	560	0.9%	4,686	18.2%	1,940	19.3%	13	0.2%	3,623	9.5%	74,095	46.9%
Aircraft	18	0.0%	204	0.8%	24	0.2%	0	0.0%	351	0.9%	6,331	4.0%
Airport Ground Support Equipment	4	0.0%	98	0.4%	13	0.1%	0	0.0%	145	0.4%	2,888	1.8%
Lawn & Garden Equipment	132	0.2%	468	1.8%	119	1.2%	2	0.0%	2,079	5.5%	41,221	26.1%
Recreational Equipment	5	0.0%	25	0.1%	4	0.0%	0	0.0%	251	0.7%	3,644	2.3%
Commercial and Industrial Equipment	116	0.2%	1,131	4.4%	407	4.1%	5	0.1%	331	0.9%	15,202	9.6%
Construction and Mining Equipment	158	0.2%	1,096	4.3%	827	8.2%	3	0.0%	154	0.4%	2,636	1.7%
Agricultural Equipment	102	0.2%	958	3.7%	478	4.8%	2	0.0%	136	0.4%	1,507	1.0%
Recreational Marine Vessels	8	0.0%	22	0.1%	4	0.0%	0	0.0%	147	0.4%	588	0.4%
Locomotives and Railroad Equipment	17	0.0%	683	2.6%	65	0.6%	0	0.0%	29	0.1%	78	0.0%
TOTAL	65,822		25,781		10,033		7,534		38,024		157,822	

Table 4–6. 2020 annual emission inventories, Ada and Canyon counties combined.

	PM_{10}		NOx		SOx		NH3		VOC		CO	
Source Category	tons/year	% of total	tons/year	% of total	tons/year	% of total	tons/year	% of total	tons/year	% of total	tons/year	% of total
Industrial Point Sources	5,279	7.6%	14,937	59.7%	7,280	71.0%	1,007	13.3%	4,754	12.2%	13,207	8.1%
Area Sources	22,992	32.9%	2,303	9.2%	145	1.4%	6,212	82.1%	28,065	72.3%	15,316	9.4%
Residential Wood Combustion	744	1.1%	68	0.3%	10	0.1%	0	0.0%	3,134	8.1%	5,419	3.3%
Other Fuel Combustion	228	0.3%	1,315	5.3%	83	0.8%	10	0.1%	61	0.2%	716	0.4%
Open Burning	2,849	4.1%	358	1.4%	52	0.5%	0	0.0%	2,343	6.0%	9,181	5.6%
Agricultural Activities	14,889	21.3%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Other Fugitive Dust	4,282	6.1%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Ammonia sources	0	0.0%	0	0.0%	0	0.0%	6,202	82.0%	0	0.0%	0	0.0%
Biogenic Emissions	0	0.0%	561	2.2%	0	0.0%	0	0.0%	11,090	28.6%	0	0.0%
VOC Sources	0	0.0%	0	0.0%	0	0.0%	0	0.0%	11,437	29.4%	0	0.0%
On-Road Mobile Sources	41,044	58.7%	3,144	12.6%	779	7.6%	332	4.4%	2,321	6.0%	56,953	35.0%
Vehicle Emissions (Exhaust, Tire Wear, & Brake Wear)	531	0.8%	3,144	12.6%	779	7.6%	332	4.4%	2,321	6.0%	56,953	35.0%
Fugitive Road Dust	40,514	58.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Non-Road Mobile Sources	580	0.8%	4,630	18.5%	2,053	20.0%	14	0.2%	3,702	9.5%	77,326	47.5%
Aircraft	20	0.0%	220	0.9%	25	0.2%	0	0.0%	362	0.9%	6,448	4.0%
Airport Ground Support Equipment	4	0.0%	104	0.4%	14	0.1%	0	0.0%	157	0.4%	3,136	1.9%
Lawn & Garden Equipment	135	0.2%	468	1.9%	122	1.2%	2	0.0%	2,127	5.5%	42,362	26.0%
Recreational Equipment	5	0.0%	25	0.1%	4	0.0%	0	0.0%	258	0.7%	3,760	2.3%
Commercial and Industrial Equipment	124	0.2%	1,187	4.7%	444	4.3%	5	0.1%	350	0.9%	16,565	10.2%
Construction and Mining Equipment	169	0.2%	1,103	4.4%	902	8.8%	4	0.0%	158	0.4%	2,876	1.8%
Agricultural Equipment	97	0.1%	815	3.3%	472	4.6%	2	0.0%	121	0.3%	1,487	0.9%
Recreational Marine Vessels	8	0.0%	23	0.1%	4	0.0%	0	0.0%	140	0.4%	615	0.4%
Locomotives and Railroad Equipment	17	0.0%	685	2.7%	65	0.6%	0	0.0%	29	0.1%	78	0.0%
TOTAL	69,895		25,014		10,257		7,565		38,841		162,802	

Table 4-7. 2010 episode emission inventories, Ada and Canyon Counties combined. Emissions correspond to the meteorology on the highest observed concentration day in the 1991 episode (January 7).

	PM10		NOx		SOx		NH3		VOC		CO	
Source Category	tons/day	% of total	tons/day	% of total	tons/day	% of total	tons/day	% of total	tons/day	% of total	tons/day	% of total
Industrial Point Sources	12.20	23.9%	44.83	57.1%	23.92	84.2%	2.77	15.4%	15.07	22.6%	38.77	9.1%
Area Sources	3.37	6.6%	5.61	7.1%	0.41	1.4%	14.49	80.6%	33.60	50.4%	22.47	5.3%
Residential Wood Combustion	2.67	5.2%	0.26	0.3%	0.04	0.1%	0.00	0.0%	9.22	13.8%	19.51	4.6%
Other Fuel Combustion	0.68	1.3%	4.67	5.9%	0.37	1.3%	0.04	0.2%	0.24	0.4%	2.90	0.7%
Open Burning	0.02	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.01	0.0%	0.06	0.0%
Agricultural Activities	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%
Other Fugitive Dust	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%
Ammonia sources	0.00	0.0%	0.00	0.0%	0.00	0.0%	14.45	80.4%	0.00	0.0%	0.00	0.0%
Biogenic Emissions	0.00	0.0%	0.67	0.9%	0.00	0.0%	0.00	0.0%	2.87	4.3%	0.00	0.0%
VOC Sources	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	21.26	31.9%	0.00	0.0%
On-Road Mobile Sources	34.66	67.8%	19.13	24.4%	1.55	5.5%	0.70	3.9%	9.59	14.4%	254.91	59.8%
Vehicle Emissions (Exhaust, Tire Wear, & Brake Wear)	0.46	0.9%	19.13	24.4%	1.55	5.5%	0.70	3.9%	9.59	14.4%	254.91	59.8%
Fugitive Road Dust	34.19	66.9%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%
Non-Road Mobile Sources	0.90	1.8%	8.98	11.4%	2.51	8.8%	0.02	0.1%	8.35	12.5%	110.39	25.9%
Aircraft	0.04	0.1%	0.52	0.7%	0.06	0.2%	0.00	0.0%	0.94	1.4%	17.07	4.0%
Airport Ground Support Equipment	0.01	0.0%	0.32	0.4%	0.03	0.1%	0.00	0.0%	0.36	0.5%	6.72	1.6%
Lawn & Garden Equipment	0.25	0.5%	0.80	1.0%	0.09	0.3%	0.00	0.0%	5.49	8.2%	40.83	9.6%
Recreational Equipment	0.00	0.0%	0.03	0.0%	0.00	0.0%	0.00	0.0%	0.19	0.3%	2.64	0.6%
Commercial and Industrial Equipment	0.29	0.6%	3.07	3.9%	0.93	3.3%	0.01	0.1%	0.95	1.4%	39.11	9.2%
Construction and Mining Equipment	0.18	0.4%	1.54	2.0%	0.89	3.1%	0.00	0.0%	0.21	0.3%	2.73	0.6%
Agricultural Equipment	0.08	0.1%	0.83	1.1%	0.33	1.1%	0.00	0.0%	0.11	0.2%	0.98	0.2%
Recreational Marine Vessels	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.04	0.1%	0.09	0.0%
Locomotives and Railroad Equipment	0.05	0.1%	1.88	2.4%	0.18	0.6%	0.00	0.0%	0.08	0.1%	0.22	0.1%
TOTAL	51.13		78.54		28.39		17.98		66.61		426.54	

Table 4-8. 2015 episode emission inventories, Ada and Canyon Counties combined. Emissions correspond to the meteorology on the highest observed concentration day in the 1991 episode (January 7).

	PM10		NOx		SOx		NH3		VOC		CO	
Source Category	tons/day	% of total	tons/day	% of total	tons/day	% of total	tons/day	% of total	tons/day	% of total	tons/day	% of total
Industrial Point Sources	12.20	21.7%	44.83	61.8%	23.92	82.9%	2.77	15.3%	15.07	22.1%	38.77	9.0%
Area Sources	3.74	6.7%	6.16	8.5%	0.45	1.6%	14.49	80.1%	36.84	54.0%	24.92	5.8%
Residential Wood Combustion	2.96	5.3%	0.29	0.4%	0.04	0.1%	0.00	0.0%	10.25	15.0%	21.63	5.0%
Other Fuel Combustion	0.76	1.3%	5.19	7.2%	0.41	1.4%	0.04	0.2%	0.26	0.4%	3.21	0.7%
Open Burning	0.02	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.01	0.0%	0.07	0.0%
Agricultural Activities	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%
Other Fugitive Dust	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%
Ammonia sources	0.00	0.0%	0.00	0.0%	0.00	0.0%	14.45	79.9%	0.00	0.0%	0.00	0.0%
Biogenic Emissions	0.00	0.0%	0.67	0.9%	0.00	0.0%	0.00	0.0%	2.87	4.2%	0.00	0.0%
VOC Sources	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	23.44	34.4%	0.00	0.0%
On-Road Mobile Sources	39.28	69.9%	12.89	17.8%	1.78	6.2%	0.81	4.4%	7.28	10.7%	248.54	57.4%
Vehicle Emissions (Exhaust, Tire Wear, & Brake Wear)	0.49	0.9%	12.89	17.8%	1.78	6.2%	0.81	4.4%	7.28	10.7%	248.54	57.4%
Fugitive Road Dust	38.79	69.1%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%
Non-Road Mobile Sources	0.95	1.7%	8.71	12.0%	2.72	9.4%	0.02	0.1%	9.03	13.2%	120.92	27.9%
Aircraft	0.05	0.1%	0.56	0.8%	0.06	0.2%	0.00	0.0%	0.96	1.4%	17.35	4.0%
Airport Ground Support Equipment	0.01	0.0%	0.33	0.5%	0.03	0.1%	0.00	0.0%	0.39	0.6%	7.38	1.7%
Lawn & Garden Equipment	0.28	0.5%	0.86	1.2%	0.10	0.4%	0.00	0.0%	6.12	9.0%	45.90	10.6%
Recreational Equipment	0.00	0.0%	0.03	0.0%	0.00	0.0%	0.00	0.0%	0.21	0.3%	2.95	0.7%
Commercial and Industrial Equipment	0.30	0.5%	3.10	4.3%	1.04	3.6%	0.01	0.1%	0.96	1.4%	43.07	9.9%
Construction and Mining Equipment	0.19	0.3%	1.30	1.8%	0.97	3.4%	0.00	0.0%	0.18	0.3%	2.99	0.7%
Agricultural Equipment	0.07	0.1%	0.65	0.9%	0.32	1.1%	0.00	0.0%	0.09	0.1%	0.96	0.2%
Recreational Marine Vessels	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.04	0.1%	0.10	0.0%
Locomotives and Railroad Equipment	0.05	0.1%	1.87	2.6%	0.18	0.6%	0.00	0.0%	0.08	0.1%	0.22	0.1%
TOTAL	56.18		72.59		28.87		18.09		68.22		433.15	

Table 4-9. 2020 episode emission inventories, Ada and Canyon Counties combined. Emissions correspond to the meteorology on the highest observed concentration day in the 1991 episode (January 7).

	PM10		NOx		SOx		NH3		VOC		CO	
Source Category	tons/day	% of total	tons/day	% of total	tons/day	% of total	tons/day	% of total	tons/day	% of total	tons/day	% of total
Industrial Point Sources	12.20	20.1%	44.83	64.0%	23.92	81.5%	2.77	15.2%	15.07	21.5%	38.77	8.7%
Area Sources	3.90	6.4%	6.52	9.3%	0.47	1.6%	14.50	79.6%	39.28	56.0%	26.04	5.9%
Residential Wood Combustion	3.09	5.1%	0.30	0.4%	0.04	0.2%	0.00	0.0%	10.66	15.2%	22.55	5.1%
Other Fuel Combustion	0.79	1.3%	5.54	7.9%	0.43	1.5%	0.04	0.2%	0.28	0.4%	3.41	0.8%
Open Burning	0.03	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.02	0.0%	0.07	0.0%
Agricultural Activities	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%
Other Fugitive Dust	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%
Ammonia sources	0.00	0.0%	0.00	0.0%	0.00	0.0%	14.45	79.4%	0.00	0.0%	0.00	0.0%
Biogenic Emissions	0.00	0.0%	0.67	1.0%	0.00	0.0%	0.00	0.0%	2.87	4.1%	0.00	0.0%
VOC Sources	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	25.45	36.3%	0.00	0.0%
On-Road Mobile Sources	43.56	71.8%	9.82	14.0%	2.04	7.0%	0.92	5.1%	6.52	9.3%	252.70	56.8%
Vehicle Emissions (Exhaust, Tire Wear, & Brake Wear)	0.55	0.9%	9.82	14.0%	2.04	7.0%	0.92	5.1%	6.52	9.3%	252.70	56.8%
Fugitive Road Dust	43.01	70.9%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%
Non-Road Mobile Sources	1.00	1.6%	8.85	12.6%	2.91	9.9%	0.02	0.1%	9.31	13.3%	127.49	28.6%
Aircraft	0.06	0.1%	0.60	0.9%	0.07	0.2%	0.00	0.0%	0.99	1.4%	17.62	4.0%
Airport Ground Support Equipment	0.01	0.0%	0.36	0.5%	0.04	0.1%	0.00	0.0%	0.42	0.6%	8.03	1.8%
Lawn & Garden Equipment	0.29	0.5%	0.87	1.2%	0.10	0.4%	0.00	0.0%	6.28	9.0%	47.20	10.6%
Recreational Equipment	0.00	0.0%	0.03	0.0%	0.00	0.0%	0.00	0.0%	0.22	0.3%	3.05	0.7%
Commercial and Industrial Equipment	0.32	0.5%	3.25	4.6%	1.14	3.9%	0.01	0.1%	1.02	1.4%	47.05	10.6%
Construction and Mining Equipment	0.20	0.3%	1.31	1.9%	1.06	3.6%	0.00	0.0%	0.19	0.3%	3.27	0.7%
Agricultural Equipment	0.07	0.1%	0.56	0.8%	0.32	1.1%	0.00	0.0%	0.08	0.1%	0.95	0.2%
Recreational Marine Vessels	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.04	0.1%	0.11	0.0%
Locomotives and Railroad Equipment	0.05	0.1%	1.87	2.7%	0.18	0.6%	0.00	0.0%	0.08	0.1%	0.22	0.0%
TOTAL	60.66		70.02		29.34		18.21		70.18		445.00	

Table 4-10. Base and future year annual emission inventories for Northern Ada County (TPY).

Year	Source Category	PM10	NOx	SOx	NH3	VOC	CO
1999	Point Sources	311	303	54	13	782	161
1999	Area Sources	6025	960	46	2183	8039	7258
1999	On-road[5]	274	6969	300	132	3462	48180
1999	Road Dust	19306	0	0	0	0	0
1999	Off-road	433	4153	998	7	3658	45469
1999	Biogenics	0	394	0	0	4802	0
1999	Total	26350	12780	1397	2335	20743	101068
2010	Point Sources	1977	2930	1419	17	2799	1862
2010	Area Sources	6821	1211	57	2181	9816	8490
2010	On-road	297	4084	422	182	2209	37392
2010	Road Dust	24184	0	0	0	0	0
2010	Off-road	391	3471	1217	8	2876	57247
2010	Biogenics	0	394	0	0	4802	0
2010	Total	33669	12090	3114	2388	22502	104991
2015	Point Sources	1977	2930	1419	17	2799	1862
2015	Area Sources	7285	1354	65	2180	10992	9396
2015	On-road	337	2856	493	211	1827	36516
2015	Road Dust	27337	0	0	0	0	0
2015	Off-road	412	3291	1326	9	3044	63436
2015	Biogenics	0	394	0	0	4802	0
2015	Total	37348	10825	3303	2417	23465	111211
2020	Point Sources	1977	2930	1419	17	2799	1862
2020	Area Sources	7372	1438	67	2179	11671	9613
2020	On-road	388	2268	570	243	1660	37322
2020	Road Dust	30130	0	0	0	0	0
2020	Off-road	430	3311	1417	10	3115	65927
2020	Biogenics	0	394	0	0	4802	0
2020	Total	40296	10341	3473	2448	24047	114724

[5] On-road source category consists of actual vehicle emissions, i.e., exhaust, tire wear, and brake wear

5.0 CONTROL MEASURES

5.1 Reasonably Available Control Measures (RACMs)

The CAA requires that moderate PM_{10} nonattainment area plans include provisions to ensure that RACM is implemented no later than 4 years after designation. The Act further requires that the plan provide for implementation of controls on PM_{10} sources, within the same time period, reflecting reasonably available control technology (RACT). RACM and RACT are not required, however, for sources that do not contribute significantly to violations of the 24-hour or annual PM_{10} NAAQS, or where additional controls on the sources would not expedite attainment of the NAAQS. The CAA's Section 189(e) requires that the RACT provision apply to gaseous precursors of PM_{10} except where EPA determines that such sources do not contribute significantly to PM_{10} levels that exceed the standard.

The 1991 Northern Ada county/Boise Particulate PM_{10} Air Quality Improvement Plan (referred to as the 1991 SIP) identified emissions from residential wood burning as the dominant particulate pollution source in Northern Ada County, accounting for 70% of wintertime daily emissions. Accordingly, the DEQ staff focused efforts to control wood burning emissions and control of these emissions were the keystone of the 1991 SIP submitted to EPA. In addition to wood smoke controls; EPA policy has identified road dust, prescribed silvicultural and agricultural burning, and stationary source control as RACT/RACM. In September 1994, EPA concurred that RACM/RACT for Northern Ada County did not require any additional direct controls outside of the wood-burning program. *See 59 FR 48585*. EPA was unable to fully approve the wood burning control measures and the modeled attainment demonstration of the 1991 SIP, however, because the SIP only included adopted ordinances for the City of Boise while indicating in the control strategy that all cities and the unincorporated areas of the Ada County would have ordinances prohibiting the sale and installation of uncertified wood stoves. Since that time, the cities have enacted wood smoke control regulations and Ada County and Garden City have prohibited uncertified wood stoves and the State of Idaho submitted a revised SIP with the adopted ordinances on December 30, 1994. In May 1996, EPA accepted the new ordinances as sufficient to satisfy the RACM/RACT requirements and fully approved the PM_{10} SIP for Northern Ada County. *See 61 FR 27020.*

The following is a brief description of the programs and rules that appear to be responsible for Northern Ada County's attaining and maintaining compliance with the PM_{10} ambient air quality standard.

Air Quality Index Program

The 1991 SIP contained the Air Quality Index (AQI) program to support the public information and regulatory components of the PM_{10} SIP. It consisted of a DEQ phone hotline to provide information on measured and predicted ambient air pollution levels, not only for PM_{10} but also Carbon Monoxide. Information on voluntary and/or mandatory wood burning curtailments was included in the daily report. Since that time, communication technology has greatly improved and currently, such information on air quality levels and burn conditions is instantly available on the DEQ website for fourteen regions of the State.

Residential Wood Burning Program

The 1991 SIP expanded an existing residential wood-burning program begun in 1981/1982. The program included improved performance and efficiency of wood heating equipment, reduced reliance on wood burning during critical air quality periods, and establishing reasonable alternatives to the use of wood for heat. Key elements in the current wood burning ban program include issuing a voluntary wood-burning ban when levels of PM_{10} reach 64 $\mu g/m^3$ and a mandatory wood-burning ban when levels reach 100 $\mu g/m^3$, a wood-smoke public education and awareness program, a wood stove certification program, and a wood stove change out program. Each city in Ada County, and the unincorporated area of the county, contains an ordinance prohibiting the use of wood stoves or fireplaces when an air quality alert occurs as noted above. Additionally, each ordinance requires only installation of EPA certified wood stoves.

Open Burning Ban Program

Similar to the Residential Wood Burning program, the Open Burning Ban program contains voluntary bans when PM_{10} reaches 64 $\mu g/m^3$ and mandatory burning bans at the Stage One Forecast and Caution level. The Stage One level is the 24-hour NAAQS, 150 $\mu g/m^3$ as set in Idaho Administrative Procedures Act (IDAPA), Rule 58.01.01.550, as modified in 2001. The voluntary ban is not supported by regulation, but does apply to both Ada and Canyon counties. Finally, the unincorporated portions of Ada County passed ordinances in 2001 that prohibit open burning at levels above approximately 70 $\mu g/m^3$. It should also be noted that the State open burning rule is currently undergoing a negotiated rulemaking process to remedy some inconsistencies with other local, state, and federal rules.

Tier II Operating Permits

DEQ is in the process of issuing Tier II Operating Permits that set emission limits for an industrial facility at its actual emissions plus a small buffer throughout Idaho. Before lowering the emission limits of a number a facilities in Ada County the Maintenance Plan future year dispersion modeling results showed the potential for PM_{10} exceedances in areas adjacent to the identified facilities as a result of the facilities allowable emissions. In an effort to resolve these potential exceedances the facilities that had large allowable emissions and facilities with no previous air quality permits were issued permits that limited all the PM_{10} emissions levels to fully meet all applicable air quality standards.

In total 13 sources required new permits to reduce allowable emission to meet air quality standards. These sources are summarized below:

Source	*w/o Tier II OP PM10 Allowable Tons/Year	w/ Tier II OP PM10 Allowable Tons/Year
LP Wood Polymers	22	5
Mike's Sand and Gravel	340	18.5
Consolidated Concrete	80	20.0
Crookham Company	250	5.92
DD Service Center	125	0.5
Plum Creek Lumber Company	100	29.9
C. Wright Construction	2200	38.3
Nelson Construction (3 sources)	99 each	40.0 each
Idaho Concrete (3 sources)	99 each	20.0 each

These estimated values were obtained from 1995 or 1999 DEQ emission inventories or Tier II operating permit application provided by the facility.

In addition to the 13 sources mentioned above, The Amalgamated Sugar Company (TASCO) in Canyon County was shown to potentially contribute to PM_{10} exceedances in Canyon County. To address this problem, DEQ has issued a new Tier II Operating Permit that requires the company to reduce emissions sufficiently to address these air quality concerns. Due to the size and complexity of emission sources at TASCO, allowable emissions will be immediately reduced to insure that TASCO impacts in Ada County are at acceptable levels. A compliance schedule in the permit then requires TASCO to add control devices within five years to ensure that TASCO does not cause or contribute to a violation of air quality standards anywhere in the Treasure Valley in the future.

All permits mentioned here are included as part of this Plan and are necessary to the Plan's demonstration of attainment.

Additional rules that complement attainment of the PM_{10} standards

Several rules contained in the Idaho statutes complement the specific PM_{10} control strategies noted above. They include the recently enacted state transportation conformity rule and an interim transportation conformity rule for Northern Ada County, approved by EPA on April 12, 2001 *See 66 FR 18873*. The state conformity rule is found in IDAPA 58.01.01.563-574, and the Northern Ada County rule is found in IDAPA 58.01.01.582. Other rules affect the emissions from industrial sources, fugitive dust, motor vehicles (especially diesel), and smoke management programs of the U.S. Forest Service.

5.2 Permanent and Enforceable Control Measures

The CAA requires that each maintenance plan demonstrate that those measures that were credited with bringing the area into attainment be federally enforceable and continued into the future. EPA has issued guidance[1] specifying that, in order for an area to be redesignated to

[1] "Procedures for Processing Requests to Redesignate Areas to Attainment," Memorandum from John Calcagni, Director, Air Quality Management Division, U.S. EPA Office of Air Quality Planning and Standards, September 4, 1992.

attainment, a State must be able to reasonably attribute the improvements in air quality to emission reductions that are permanent and enforceable. Economic downturns and unusual meteorology are not acceptable strategies to lower pollutant levels since they may not be sustainable in future scenarios. The residential wood burning ban program, and the open burning ban program meet this requirement as they are enacted and currently being implemented at the respective levels of government throughout Northern Ada County. These were approved by the EPA (*See 59 FR 48583)* as meeting the RACM/RACT requirements. They were also found to meet the enforceability requirements of the CAA. The Maintenance Demonstration contained in Section 6 provides documentation that assures the area will maintain PM_{10} attainment for the foreseeable future as a result of implementing these measures. Therefore, the Northern Ada County plan meets the CAA requirement for permanent and enforceable control measures.

5.3 Contingency Measures

Section 175A of the Act requires that a maintenance plan include contingency provisions, as necessary to promptly correct any violation of the NAAQS which may occur after redesignation of the area to attainment. Moderate PM_{10} nonattainment areas must include adopted contingency measures that would control the equivalent of 25% of the needed emission reductions. The 25% figure is the amount approximately required to demonstrate Reasonable Further Progress. DEQ's revisions (July 13, 1995) to the 1991 SIP included emission reductions from "over-control" of the core SIP measures. Fugitive road dust and wood smoke control measure reductions in the SIP provided 18% of the required 25% CAA contingency measure reduction requirement. The remaining 7% would be obtained in an existing agreement with the Idaho Transportation Department (IDT) and the Ada County Highway Department (ACHD) to reduce particulates by prioritized road sanding of those streets having the highest potential to emit PM_{10}.

Normally, contingency measures in a maintenance plan are distinct from those in the attainment plan[2]. An exception, which appears to apply to the Northern Ada County plan, is that if the contingency measures in the nonattainment area SIP have not been implemented to attain the standards and they include a requirement that the State will implement all of the PM_{10} control measures which were contained in the SIP before redesignation to attainment, then they can be carried over into the area's Maintenance Plan. The contingency measures in the approved nonattainment plan, described below, have not been used to help attain the standards. The adopted measures in the approved nonattainment plan are:

(1) Over control from wood smoke control measures designed to attain the standards. The 1991 SIP wood smoke program required an 18% reduction in emissions to lead to overall attainment of the 24-hour PM_{10} standard by 1994. Based upon the modeling in the 1991 SIP, the control measures adopted provide an estimated 25% reduction, which amount to 17% additional reduction than necessary. This leaves another 8% reduction required from other contingency measures to satisfy the overall 25% reduction requirement from the EPA.

[2] See Section 172(c)(9) of the CAA for requirements in the nonattainment plan.

(2) Reduction of fugitive road dust. The 1995 submittal by DEQ of revisions to the 1991 SIP included a signed agreement with the IDT and the ACHD that detailed a road-sweeping program designed to reduce particulate emissions. This would be implemented by prioritizing road sweeping for streets having the highest potential for emitting PM_{10} and in areas having highest potential levels of PM_{10} . Those streets with highest entrained dust will be swept first and more frequently. The estimated reduction in PM_{10} emissions is 9%, and, when combined with the over control from wood smoke measures, more than satisfies the total 25% contingency measure requirement.

The following list of contingency measures consists of those measures currently being developed throughout Ada and Canyon counties, as well as other measures that can be implemented in Ada County and may be implemented in Canyon County if there is a measured exceedance of the federal PM_{10} standard in the future.

- Adopt local ordinances that require the covering of all loads of material that may have the potential to contribute to particulate matter pollution.

- Adopt local ordinances that require no track out onto paved roads from sites.

- Adopt local ordinances that require no burning of household garbage.

- Eliminate local permits that allow any kind of uncontrolled, outdoor burning not specifically allowed under Idaho State law.

- Expand the existing Vehicle Inspection and Maintenance Program to include the testing of all registered vehicles in Ada County.

- Expand mandatory burning restrictions to include clean burning woodstoves during air quality alerts.

- Adopt local ordinances that prohibit the construction of any unpaved private roads, driveways or parking lots.

Due to continual changes in the mixture of PM_{10} sources and evolving technologies to understand and control PM_{10} emissions and precursor gases other contingency measures may become viable in the future. Examples of potential future contingency measures might include the reduction the Reid Vapor Pressure (RVP) of gasoline, requiring the use of decreased sulfur levels in fuels, biodiesel additives to fuel, and instituting a vapor recovery program for fueling operations throughout Ada and Canyon Counties. The Department of Environmental Quality and the Community Planning Association will continue to evaluate the need and viability of additional contingency measures and will consider future additions to the previously listed contingency measures if it becomes necessary.

6.0 MAINTENANCE DEMONSTRATION

The heart of the Maintenance Plan is the demonstration that the standards will be maintained for at least ten years after the date of redesignation to attainment. Several of the technical aspects of this demonstration have been discussed in previous sections, i.e., emission inventories and control measures. This section will address the air quality modeling results that derived from the previously discussed information. Additionally, it will describe several additional commitments required under the CAA and EPA guidance as constituents to the maintenance demonstration. These elements include continued air monitoring and attainment verification, insurance that future permitting of new and modified stationary sources will not jeopardize maintenance, and a commitment by the DEQ to review and update the Maintenance SIP on a regular basis.

6.1 Air Quality Modeling

The Maintenance Plan needs to be based on accurate estimates of the contribution each source makes to PM_{10} during the winter stagnation episodes when the 24-hour PM_{10} standards have been historically exceeded (note that the annual PM_{10} standard has never been violated in northern Ada County). A key component of any attainment or maintenance SIP is predicting future PM_{10} concentrations showing continued attainment of the standard. The attainment demonstration in this plan is based on episodic dispersion model predictive tools and on annual speciated linear rollback techniques. Receptor modeling is used to quantify source impacts on specific days that have high PM_{10} concentrations, and to evaluate the accuracy of the dispersion models used to predict future PM_{10} concentrations. Finally, the latest mobile source emission models were used to estimate current and future impacts of mobile sources as input to the attainment and maintenance demonstrations.

6.1.1 Model Selection

Several studies have been undertaken in the past to model future year PM_{10} conditions in the Northern Ada County (Boise) area of southwestern Idaho. These have included a variety of methodologies, including receptor modeling and speciated rollback, Gaussian plume modeling with ISCST3, and grid modeling using WYNDvalley. Results from all of these approaches have indicated that during worst-case episodic meteorological conditions, which occurred in January 1991, the estimated future year PM_{10} emission inventories lead to exceedances of the 24-hour PM_{10} NAAQS after 2010. All of these approaches were acceptable according to past (1987) EPA PM_{10} SIP modeling guidance, and EPA listed ISC and WYNDvalley in 1995 as preferred and alternative guideline air quality models, respectively.

These past modeling approaches focused on primary (directly emitted) PM_{10} constituents, including wood smoke and fugitive dust, and did not address secondary aerosols that are chemically formed in the atmosphere from precursors. However, as controls on the sources of primary constituents have lowered PM_{10} levels in Northern Ada County, secondary PM has become a larger relative fraction of the PM_{10} loading. It is conceptually possible that rapid growth in population, industry, and motor vehicle activity may drive secondary PM to be a

major contributor to exceedances in the future. Furthermore, new EPA guidance on modeling for the fine PM standard describes the need for modeling systems to adequately treat the processes associated with secondary PM formation. Therefore, it was imperative that the current episodic PM_{10} modeling effort for Ada County employs a more rigorous modeling approach than previous studies.

For an air quality model to qualify as a candidate for use in a regulatory attainment demonstration, EPA requires the State to show that it meets the following general criteria:

- The model has undergone scientific peer review;
- The model can be demonstrated to be applicable to the problem on a theoretical basis;
- The data bases which are necessary to perform the analysis are available and adequate;
- Appropriate performance evaluations of the model have shown that the model is not biased toward underestimates;
- The model and its source code are readily available in the public domain at little or no cost, and are not proprietary; and
- A protocol on methods and procedures has been established.

The leading episodic and long-term (annual) Eulerian PM models were judged by their technical rigor and capabilities for developing SIPs for fine PM. This review then examined the important capabilities and limitation of the three leading models applicable to Boise, related them to the six EPA criteria above, and provided an argument for the selection of a single modeling platform. The basis of the ultimate model selection focused on the applicability of the model to the episodic conditions of Northern Ada County. Details of this review are contained in Appendix C.

The episodic dispersion model selected for this study was CAMx, an Eulerian (gridded) photochemical model with a reduced-form aerosol chemistry algorithm. The modeling grid domain was configured to cover the focus area of Ada and Canyon counties, and surrounding environs, with 1 km grid cell size. The vertical depth of the domain extended from the surface to about 1500 m. CAMx was supplied with hourly three-dimensional gridded meteorological fields (winds, temperature, pressure, moisture, clouds) generated from the MM5 meteorological model. The development and evaluation of meteorological fields with MM5 are fully described in a supplementary Meteorological Modeling report (See Appendix D). CAMx was first applied to a December 1999 PM episode using episode-specific emissions and meteorology to establish and demonstrate acceptable model performance in replicating 24-hour PM_{10} levels. Then the model was used to estimate 24-hour PM_{10} levels in three future years by simulating the worst-case meteorological conditions of the January 1991 exceedance episode in combination with future year episodic emission inventories.

6.1.2 Episode Selection

Meteorological conditions leading to measured 24-hour PM_{10} exceedances in Ada County were examined to determine an appropriate worst-case meteorological episode for attainment demonstration purposes. The episodes examined led to the exceedances shown in Table 6-1 below. Multi-day episodes were defined to consider the build-up and eventual break-up of stagnation conditions leading to elevated particulate levels. The episodes are:

December 11, 1985 to January 1, 1986;
January 7-15, 1986;
January 20-29, 1988; and
January 4-7, 1991.

These episodes represent the most extreme cases of the meteorological conditions conducive to the formation of elevated PM_{10} concentrations since monitoring began in December 1985.

Table 6-1. Daily exceedances of PM_{10} in Ada County, Idaho, with associated meteorological data.

Year	Month	Day	Site	PM_{10} ($\mu g\ m^{-3}$)	Avg. Temp (^oC)	Avg. Wind Speed (mph)	Avg. Wind Dir. (deg)	Precip (in/day)
1986	Jan	14	FS5	314	-10	5.5	175	0.00
1988	Jan	28	FS5	165	-2	5.2	214	0.00
1991	Jan	7	FS5	173	-8	5.9	244	0.09
1991	Jan	7	MVS	164	-8	5.9	244	0.09

Detailed descriptions of the episodes and PM_{10} exceedances are provided in the full report on Dispersion Modeling in Appendix C. Surface data were collected at the NWS station at the Boise airport (43°34'N, 116°13'W, elevation 2,840 feet). Upper-air data were collected twice daily (0500 and 1700 LST), also at the Boise airport, as a part of the global rawinsonde network. PM_{10} concentration data were collected and quality assured by the DEQ.

Severe stagnation events leading to exceedances of the PM_{10} standard rarely occur in Northern Ada County. The last such event occurred in January 1991. Based upon the analysis of the historical meteorological conditions for the four episodes summarized above, DEQ selected the January 1991 episode as the worst-case episode to be used for the attainment demonstration modeling. Although the 1985 episode produced a longer lasting and slightly stronger stagnation event, the event in January 1991 resulted when record-cold temperatures were measured in Northern Ada County. Furthermore, the January 1991 event was better documented by available monitoring data. The January 1991 event represents a severe stagnation event in which high PM_{10} levels occurred with significant amounts of secondary aerosol, and as such is the appropriate episode to represent worst-case meteorology for the Northern Ada County PM_{10} Maintenance Plan demonstration.

6.1.3 Modeling Demonstration Approach

Before deterministic (predictive) air quality models such as CAMx are used to forecast episodic PM_{10} patterns into future years, they must first be applied to a historical episode in order to evaluate their ability to replicate air quality conditions in the region and period of interest. If the model can demonstrate good performance in this "base year performance evaluation", then it provides some faith that the model can be used for future year analyses. Normally the historical episode chosen for evaluation is the same carried forward in the future year forecasts (for example, the chosen PM_{10} exceedance episode of January 1991). In this study, however, CAMx was evaluated for a more recent episode in 1999 for the reasons given below.

Complex meteorological and photochemical grid models require a substantive quantity of observational data to define various inputs, and to fully evaluate their predictive performance. Measurements of 24-hour PM_{10} measurements were available from two sites on all six days of the January 4-9, 1991 episode, as were speciated mass budgets at the two sites on January 4 and 7 (DRI, 1998). These were considered marginally sufficient to gauge dispersion model performance. However, this episode suffered from a lack of other data needed by the emissions and dispersion modeling efforts. Quality assured and audited meteorological data were only available from one site (the NWS site at Boise airport) during this period; the 1991 emissions inventory used in past modeling exercises focused on wood smoke, utilized crude estimates for other source sectors, and did not include secondary PM precursor emission rates (NOx, SOx, NH_3); and the 1995 revised emissions inventory did not entirely cover the larger modeling domain defined for this study. Furthermore, for this project the DEQ placed a major emphasis on the "bottom-up" development of a more recent and detailed emission inventory from which to project future year budgets; resources and schedule were insufficient to hind cast the 1999 emissions inventory to 1991 with a level of certainty and technical quality needed for this study.

In winter 1999/2000, the DEQ and DRI undertook a field study to measure secondary aerosol formation in the Treasure Valley (DRI, 2000). During that season, peak PM_{10} levels reached moderate levels (70 $\mu g/m^3$) over the particularly stable and stagnant period of December 20-24, 1999. The 1999/2000 DRI study provided a much broader database for PM from seven monitoring sites. In addition, hourly meteorological data were available from five sites in the region, including the NWS Boise airport, the DEQ meteorological tower, the Caldwell airport, and two PM monitoring sites.

Given the data constraints of the 1991 episode, the improved PM and meteorological measurement database available from the 1999/2000 DRI Treasure Valley Secondary Aerosol Study, and the need for an updated 1999 emissions inventory with significantly more detail, it was decided that the base year dispersion model performance evaluation would be conducted for the December 20-24, 1999 episode. The CAMx model was provided with episode-specific hourly emission rates from the new 1999 inventory and with hourly three-dimensional meteorological fields from the MM5 model (see Appendix C). The results of the 1999 base year model performance evaluation and verification are summarized below in Section 6.1.4. Once adequate model performance in characterizing PM conditions over the base year episode was demonstrated, the future year episodic 24-hour maintenance modeling commenced.

The purpose of future year dispersion modeling is to estimate the air quality conditions that result from projections of PM and precursor emission patterns, and to demonstrate whether current emission control plans are sufficient to maintain PM_{10} levels below the 24-hour and annual standards. For the Ada County demonstration, the maintenance period extends through 2015; thus, modeling was performed using emission projections for 2015, and two additional years (2010 and 2020) to evaluate conditions during an intermediate year and an out year for consistency with the PM conformity schedule.

Future year episodic modeling was based on the January 1991 conditions that resulted in the last PM_{10} exceedance in Ada County. Meteorology was modeled with MM5 for January 2-9, 1991 as described in Appendix D, and January episodic gridded model-ready emission inputs were developed based on estimated activity in the 2010, 2015, and 2020 years. CAMx was

used to combine the January 1991 "worst-case" meteorology with the future year episodic emission projections to estimate the PM_{10} conditions in the basin. Resulting PM distributions were analyzed to determine if PM_{10} concentrations in Ada County would exceed the 24-hour standard in these years if the worst-case conditions were to occur again. CAMx was also run with the 1999 meteorology in conjunction with the future year emission inventories as an additional check for maintenance, and as a way to provide a more consistent approach between the base year performance evaluation and the future year attainment modeling.

Initial dispersion modeling of the future years utilized emission estimates in all counties at their full estimated future capacity (see Table 4-4); i.e., no special local short-term episodic control measures for Ada County were included. However, this "uncontrolled" emissions inventory did include all currently established long-term local emission reductions such as I/M programs, fireplace building codes, as well as federal-level programs for fuel composition and vehicle fleet emissions. It should be noted that the full paved road dust emission rates were scaled down by a factor of 2.4 (See Appendix A, Emission Inventory), and unpaved road dust emissions were completely removed, when modeling with January 1991 meteorology to reflect the mitigating effects of snow cover. In the case where CAMx was run for the December 20-24, 1999 period with the future year inventories, the full road dust emission rates were included due to lack of snow.

The results for the January 1991 episode suggested that the full inventories in all three years would yield PM_{10} concentrations in exceedance of the 24-hour standard in Ada County. Therefore, the CAMx runs were repeated with episodic voluntary wood-burning bans following procedures in accordance with generally how the ban would be called by the DEQ. With the burn ban in place, maintenance of the 24-hour standard was demonstrated for Ada County. Details of the results of theses analyses are presented in Section 6.1.5.

6.1.4 Episodic Model Verification

A rigorous episodic model performance evaluation was undertaken to build confidence in the modeling system's reliability as a PM prediction tool. Detailed analyses were performed for the December 1999 PM episode to ensure that CAMx accurately predicts the timing, location, and chemical speciation of PM throughout the area of interest. Specific attention was given to the secondary PM products. The performance evaluation provided insight into the following:

- Are PM patterns simulated well according to observations?
- Are PM patterns simulated well according to the conceptual model of PM buildup in the Treasure Valley?
- What are the reasons for poor performance?
- Are good results robust (are they the result of a proper distribution among species, proper transport/buildup mechanisms, etc.), or are they serendipitous?
- What is the sensitivity of the model to modifications in key inputs with the largest uncertainty (vertical diffusion, emissions, aerosol size, etc.)?

While CAMx performance in replicating total PM_{10} and its constituent species was quite acceptable over December 20-24, the model was not able to replicate the clearing process on December 25 and 26 when 24-hour PM_{10} concentrations were only 21 to 37 μg/m3 in Ada

County. The performance for secondary species was quite good over December 20-23, but their concentrations were under predicted on December 24-25. Performance for primary species was good on December 20-24, but the carbon species (elemental and organic) and coarse mass were over predicted on December 25.

It is noted that the model performed best on the highest PM_{10} days of December 22-24 in terms of replicating total PM_{10} and the speciated mass budget (i.e., species contributions to the total mass); see Figure 6-1. The performance for each chemical constituent was better or on par with what has been achieved in other modeling studies, as indicated by the Draft EPA guidance for fine PM modeling (EPA, 2001). This is important as it establishes confidence that the high concentrations were being modeled for the correct reasons. Poor performance on the last two low PM_{10} days was attributed to two major issues:

- Actual emissions peculiar to activities on Christmas Day (Saturday) and the day after (Sunday), especially regarding residential wood burning and traffic volumes, likely caused a significant deviation from the "typical" weekday/weekend emission estimates developed in the modeling;
- The MM5 meteorological simulation did not replicate the development of widespread fog on December 24-26 to the extent that it was observed. The presence of the real ice fog that formed probably had a large influence on actual heterogeneous nitrate and sulfate formation (today's models are only able to represent aqueous sulfate formation in liquid fog), certainly increased removal processes for PM (models estimate wet removal for rainfall rates above a minimum threshold), and decreased emissions of road dust due to wet/frozen surfaces. Furthermore, without a dynamic aerosol size model, CAMx could not account for particle growth by hydration in the fog, and their subsequent increase in sedimentation rates.

It is for these reasons that the last two days of the December 1999 episode were dropped from consideration in sensitivity analyses, and in the analysis of the future year scenarios. See Appendix C for details of this analysis.

Once the base case performance evaluation was completed and the modeling system was deemed acceptable in replicating PM conditions over December 20-24, 1999, two additional simulations were undertaken to test the CAMx sensitivity to alternative meteorological inputs. A new MM5 meteorological simulation was carried for the December 1999 episode that included some changes in the configuration of various MM5 options. The main purpose of this additional run was to parallel the MM5 configuration used for the January 1991 episode, which by necessity had to be configured differently than the original MM5 simulation for December 1999 in order to achieve acceptable meteorological model performance. The development and performance evaluation of meteorological fields for January 1991 were carried out subsequent to the completion of the original December 1999 MM5 simulation. The concern was that a different means of modeling the meteorology in the January 1991 episode might lead to a significant uncertainty in CAMx for the future year results relative to the approach used for the December 1999 base year episode. These meteorological tests attempted to establish some quantitative uncertainty bounds on the PM_{10} simulation due to the different MM5 modeling approaches.

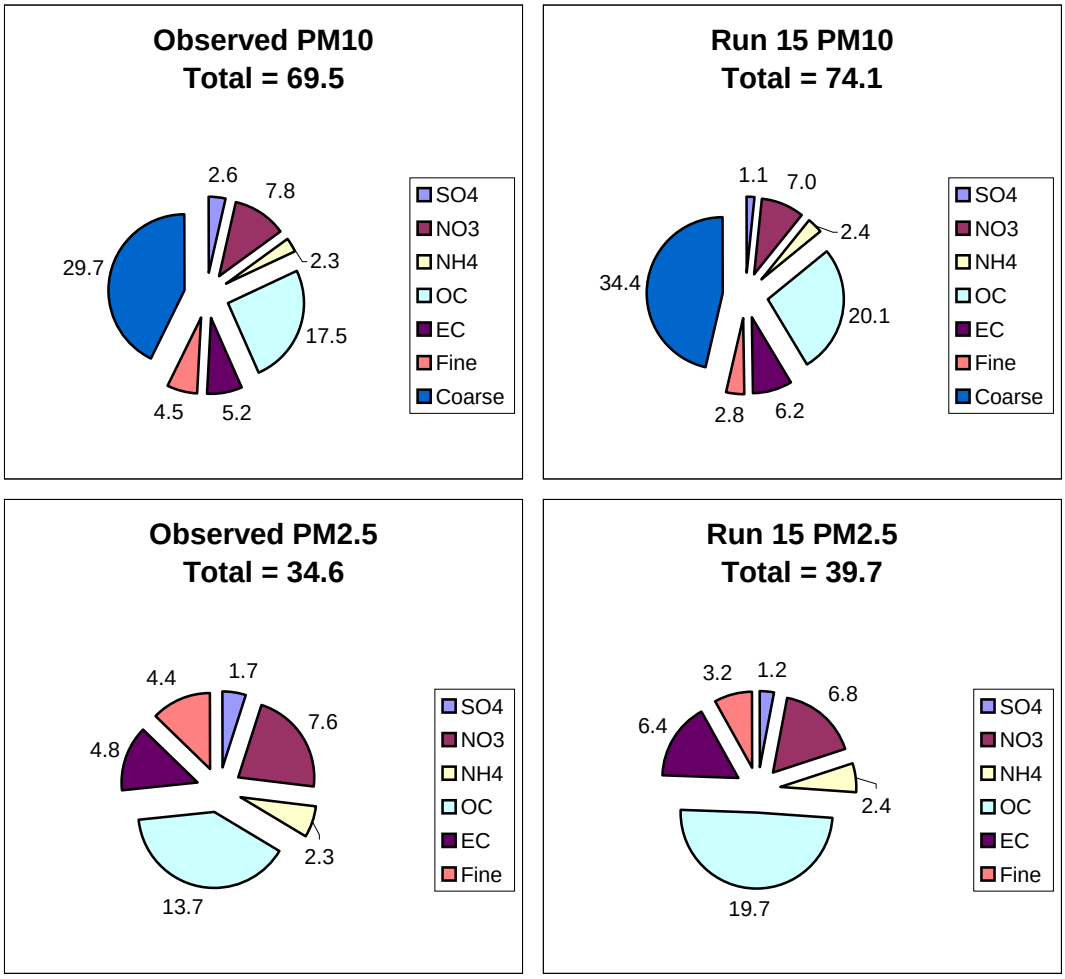

Figure 6-1. Average observed and predicted $PM_{2.5}$ and PM_{10} mass budgets over December 22-24, 1999. Total PM mass is shown at the top of each plot. The sizes of each pie section show the relative contribution to the total, while the numbers associated with each section show the absolute concentration.

Results from this inter comparison showed that no single meteorological realization was particularly better for PM_{10} model performance than any other. However, it did show that the model is sensitive to the approach for defining vertical mixing rates, as the differences in mixing contributed to the majority of PM concentration differences seen between the various runs. It was concluded that CAMx reproduced the observed fine and total mass budgets well for all meteorological realizations, and that the prediction differences among the various CAMx configurations were not particularly large. This is a testament to the quality of the estimated emissions inventory. It also indicates that introduction of alternative meteorological fields does not alter the budgets in any profound manner, and this was the expected result.

6.1.5 Modeling Results

Table 6-2 displays the predicted peak 24-hour PM_{10} in Ada County for each day of the episodes. For the January 1991 period, the maximum-modeled concentration occurs on January 5 in all three future years (170, 188, and 193 $\mu g/m^3$); this is the only day in which the estimates are above the 24-hour standard of 150 $\mu g/m^3$ (see Figure 6-2 for the 2015 case). The maximum-modeled concentrations over the December 1999 period all occur on December 24 (127, 139, and 143 $\mu g/m^3$). No days in the December 1999 episode are predicted to be over the standard in any future year.

Table 6-2. Predicted peak 24-hour PM_{10} ($\mu g/m^3$) in Ada County in three future years over the January 1991 and December 1999 meteorological episodes.

Date	2010	2015	2020
January 1991 Episode			
Jan 2	96	98	99
Jan 3	101	105	110
Jan 4	109	113	119
Jan 5	170	188	193
Jan 6	100	110	114
Jan 7	46	48	51
Jan 8	121	122	124
Jan 9	48	50	53
December 1999 Episode			
Dec 20	110	114	117
Dec 21	78	84	88
Dec 22	84	88	95
Dec 23	96	104	110
Dec 24	127	139	143

The DEQ residential wood burning ban program comprises a tiered approach, with a voluntary-based ban triggered at relatively moderate PM_{10} levels, followed by a mandatory ban triggered at higher PM_{10} levels. Specifically, the voluntary burn ban is called for Ada and Canyon Counties when the preceding day's maximum monitored 24-hour PM_{10} concentration exceeds 74 $\mu g/m^3$ at any monitoring location. The assumed effectiveness of the voluntary reduction is a 43% reduction in residential wood smoke emissions (See the 1991 SIP). The mandatory burn ban is called for Ada County only, and is triggered at 100 $\mu g/m^3$ and above. The effectiveness of this control is assumed to be 80%. According to the DEQ, the voluntary and mandatory bans remain in effect until the DEQ identifies when the prevailing meteorological conditions improve to end the pollution episode. A ban on open burning is also called for Ada County, Nampa, and Caldwell based on a 74 $\mu g/m^3$ trigger, however, this was not considered in the future year analyses as no open burning emissions were included in the modeling inventories.

In the January 1991 case described above (no burn ban), the simulated 24-hour PM_{10} concentration on January 2 at Boise Fire Station #5 exceeded the voluntary trigger in all three future years (83, 89, and 94 $\mu g/m^3$). The Boise Fire Station #5 has the highest historical

measured value of PM_{10} in the Treasure Valley. Therefore, the emissions inventory was revised for January 3-9 to include a 43% reduction in residential wood combustion emissions. While the rule calls for a voluntary ban in both Ada and Canyon Counties, controls were only applied to the modeling inventory in Ada County.

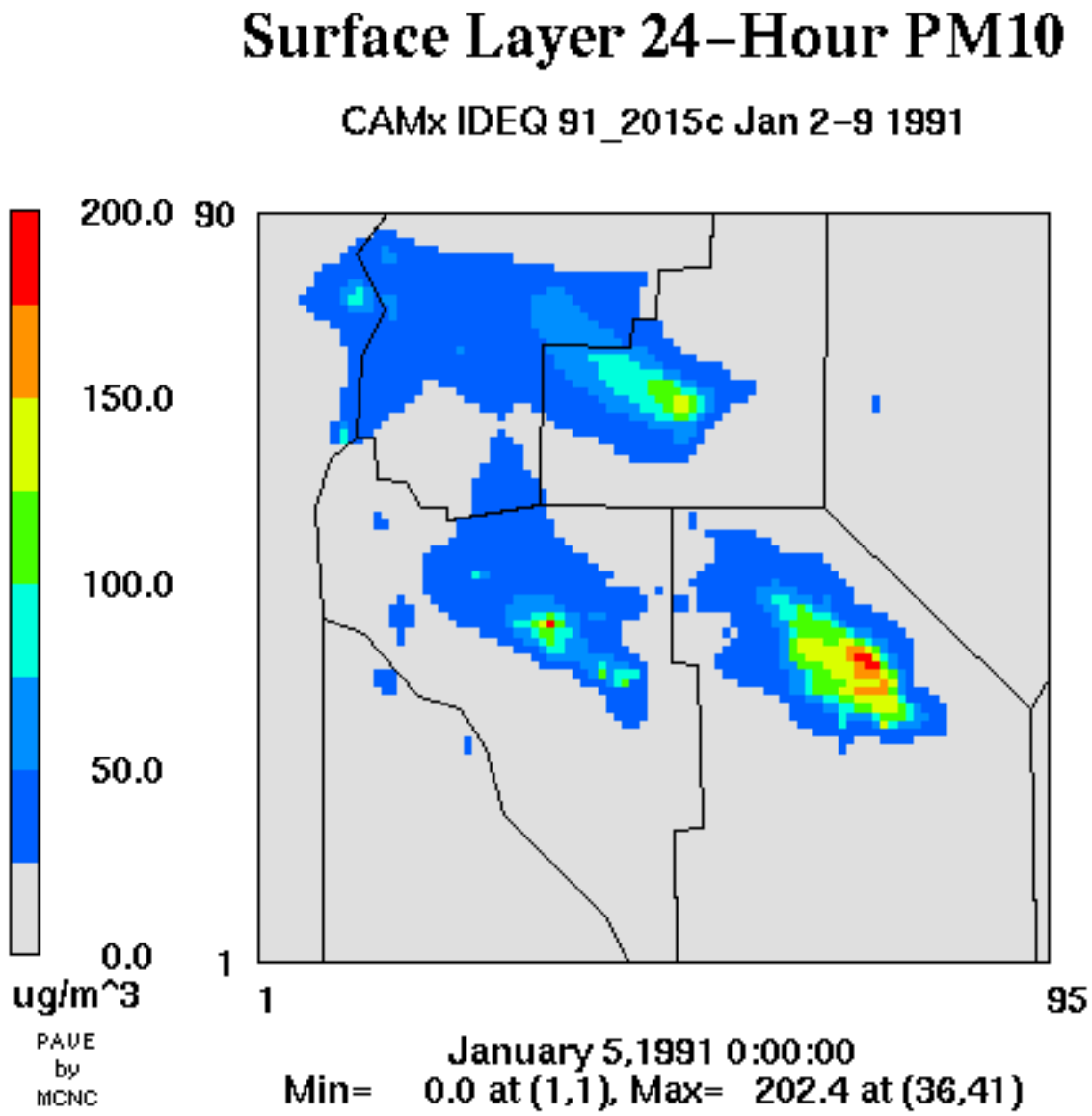

Figure 6-2. Spatial distribution of predicted 24-hour PM_{10} on January 5, 1991 for the 2015 future year uncontrolled case. The maximum noted at 202.4 $\mu g/m^3$ is predicted in Canyon County; the maximum in Northern Ada County is 188 $\mu g/m^3$.

In the December 1999 case described above, the simulated 24-hour PM_{10} on December 20 at BFS5 exceeded the voluntary trigger in 2010 and 2015 (93 and 99 $\mu g/m^3$), and exceeded the mandatory trigger in 2020 (104 $\mu g/m^3$). However, since the simulations of all three future years showed maintenance in Northern Ada County (Table 7-1), additional simulations with burn bans included were not undertaken for the December 1999 period.

Table 6-3 displays the predicted peak 24-hour PM_{10} in Northern Ada County for each day of the January episode when the voluntary burn bans were included in the emissions inventory. Note that the voluntary measure was estimated to be sufficient to maintain the PM_{10} standard in Northern Ada County (see Figure 6-3 for the 2015 case). On January 5th, predicted concentrations at BFS5 reached 108, 117, and 121 $\mu g/m^3$ in the three future years. This would trigger the mandatory burn ban through the remainder of the episode (January 6-9); however, the additional controls were not modeled as the voluntary ban was predicted to be sufficient to reach attainment.

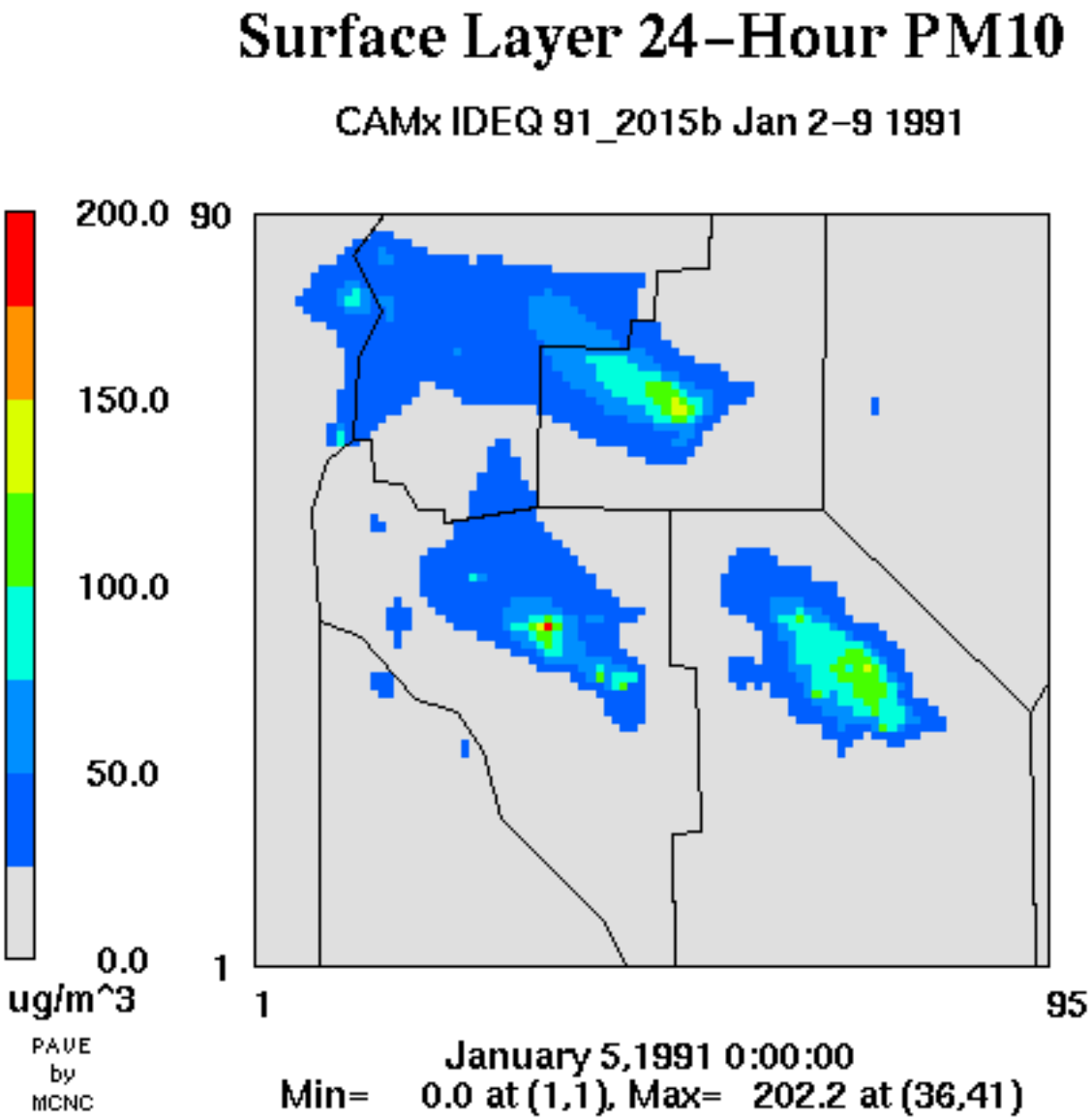

Figure 6-3. Spatial distribution of predicted 24-hour PM_{10} on January 5, 1991 for the 2015 future year case with voluntary burn ban applied in Northern Ada County. The maximum noted at 202.2 $\mu g/m^3$ is predicted in Canyon County; the maximum in Northern Ada County is 126 $\mu g/m^3$.

Table 6-3. Predicted peak 24-hour PM_{10} ($\mu g/m^3$) in Northern Ada County in three future years over the January 1991 meteorological episode. This case included a 43% voluntary reduction in residential wood smoke emissions in Ada County.

Date	2010	2015	2020
January 1991 Episode			
Jan 2	96	98	99
Jan 3	95	98	103
Jan 4	103	106	111
Jan 5	122	126	130
Jan 6	72	77	81
Jan 7	42	44	47
Jan 8	119	121	122
Jan 9	44	46	49

6.2 Receptor Modeling Results

The general objective of the receptor modeling analysis was to compare ambient speciated PM concentrations at the attainment demonstration monitoring site located at the Boise Fire Station 5 (BFS5) with emission source speciation profiles. As such, the receptor modeling results reported here are relevant only to that monitoring site.

Ambient (measured) and source (emissions) chemical profiles were compared using a basic Chemical Mass Balance (CMB) model, as well as two hybrid models that incorporated aspects of the CMB model and aspects of the emission inventory. Application of these models on the two highest 1991 PM_{10} episode days at BFS5 indicated that emissions from gasoline powered vehicles, diesel powered vehicles and wood combustion were responsible for about equal portions of the PM_{10} mass and together accounted for 82% of the mass as indicated in Figure 6-4. Other combustion sources and road dust accounted for 12% and 6%, respectively. Secondary PM species were responsible for about 60% of the PM_{10} mass on these two high PM_{10} episode days in 1991.

For the two highest study days in 1999, the total PM_{10} mass, the speciated mass budget, and source contributions were not representative of the PM_{10} exceedance measurements in 1991 (Figure 6-4), but provide substantial variability with which to test and evaluate dispersion model applications. December 25, 1999, one of the lowest PM_{10} days during the 1999 study period (37 $\mu g/m^3$), was similar to the 1991 PM_{10} episode days in that the secondary PM_{10} component accounted for 50% of the PM_{10} and road dust accounted for 6% of the mass. On this day, about 10% of the NOx and about 90% of the SOx were converted to nitrate and sulfate, respectively.

Model and statistical analysis results indicate that PM_{10} concentrations measured at BFS5 are dominated by well-mixed primary and secondary precursor emissions from area and mobile sources in the general area of the monitor. Based on these conclusions, future PM_{10} impacts should be proportional to the ratio of future emission inventories relative to the emissions during the winter of 1991, assuming similar meteorology to the two highest 1991 PM_{10} episode days and similar conversion fractions to those measured on December 25, 1999. Future

attainment under worst-case meteorological conditions could be shown by demonstrating control of emissions from these specific source categories. Impacts from industrial sources were estimated to be less than 0.5 $\mu g/m^3$ or less than about 1% on these high PM_{10} days.

Figure 6-4 compares the CMB-EIS results for the two highest PM_{10} days in the December 1999 study period with the two highest PM_{10} exceedance days in 1991. Note: These CMB results are applicable only to the attainment demonstration monitoring site located at the Boise No. 5 Fire Station.

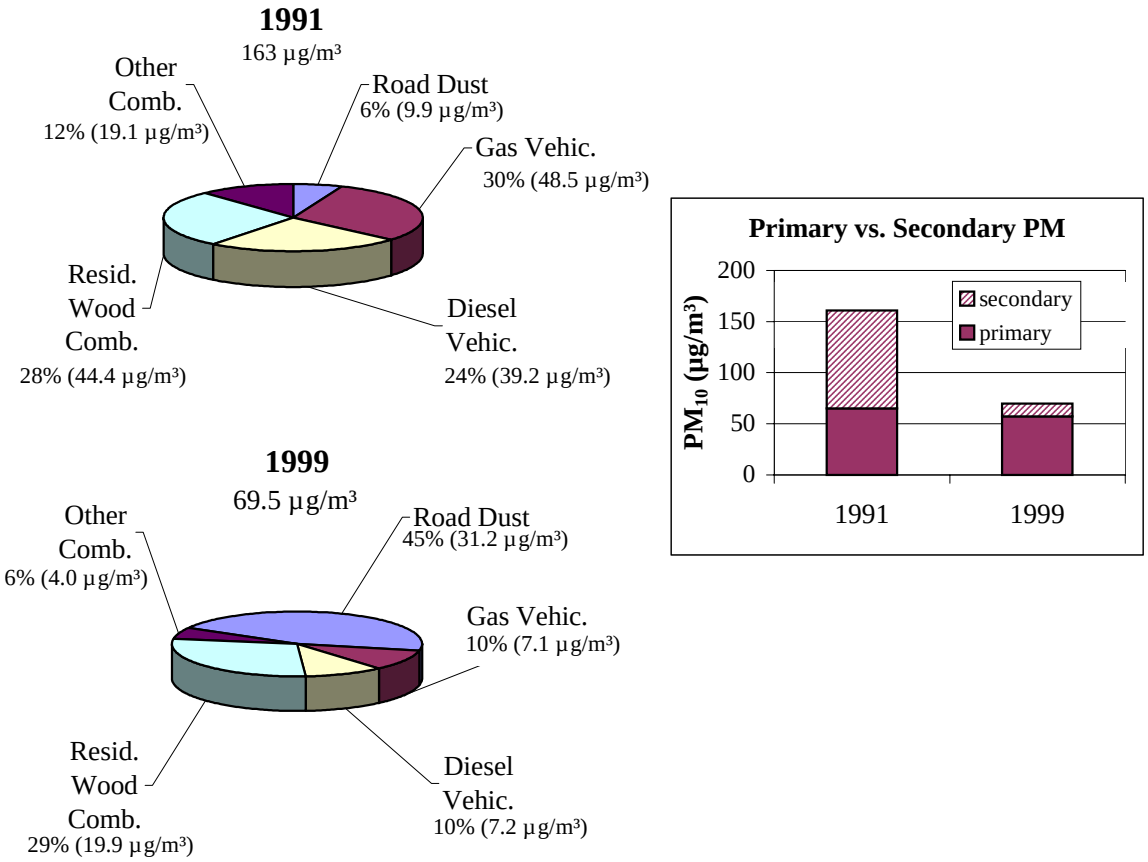

Figure 6-4. Comparison of CMB-EIS results for the two highest PM_{10} days in the December 1999 study period with the two highest PM_{10} exceedance days in 1991.

6.3 Annual Speciated Linear Rollback Modeling

6.3.1 Background

Although the annual average PM_{10} concentrations in Ada County have never exceeded the NAAQS, the annual average PM_{10} concentrations for future years must be estimated for the PM_{10} Maintenance Plan, as emissions changes would affect air quality in the area.

The PM_{10} speciated linear rollback model used in this analysis was originally developed by the Desert Research Institute in their modeling of Treasure Valley PM_{10} in 1998. The model uses

chemically resolved background and urban ambient PM_{10} concentrations, emissions inventories, and source-specific chemical profiles to assess the impacts of major air pollution sources on PM_{10} levels.

Linear rollback assumes that the change in ambient pollutant concentration in excess of background is proportional to the change in the basin-wide emission rate. Suspended particulate matter is composed of several major chemical components, notably geological material, organic carbon, elemental carbon, ammonium sulfate, and ammonium nitrate. Most of the first three materials are directly emitted by sources (primary particles). Ammonium nitrate and ammonium sulfate are chemically formed in the atmosphere from emissions of ammonia, sulfur dioxide, and oxides of nitrogen gases (secondary particles). If "speciated" linear rollback modeling is applied to each of these chemical components, rather than to total PM_{10} concentration, we can resolve the changes in PM_{10} by species as the inventory grows, according to chemical profiles known for each major source sector. This further provides an approximation to which reduction strategies among emission sectors might result in the most efficient approach to lower ambient concentrations.

Modeled PM_{10} component concentrations are calculated using the following equation:

$$C_i^f = \left(\frac{E_i^f}{E_i^b} \right) (C_i^b - bg_i) + bg_i$$

where E_i, C_i, and bg_i are the emissions, concentrations, and background concentrations of component i. The superscripts f and b indicate future (controlled) and base cases.

Linear rollback does not consider the effects of meteorological transport between source and receptor, nor of differences in gas-to-particle conversion rates for different precursors. It is most valid for spatial and temporal averages of ambient concentrations that represent the entire airshed containing urban-scale sources. The effect of transport from distant sources located outside the airshed is taken into account by subtracting out background concentrations from the total measured in basin.

6.3.2 Results of Rollback Modeling

For this study, speciated rollback modeling assumes that the aerosol is made up of five major components: geologic material, organic mass, elemental carbon, ammonium sulfate, and ammonium nitrate. Projected increases in ambient PM_{10} for future years are evaluated on a component-by-component basis. Speciated rollback modeling requires three types of data sets: ambient speciated concentrations, base and future year emissions inventories by major source category, and source-specific chemical profiles.

Certain input data components were taken from previous PM_{10} rollback modeling (DRI, 1998) conducted in Ada and Canyon Counties. These included source-specific chemical profiles, which are used to convert emissions to incremental PM_{10} species concentrations. The annual PM_{10} mass budget for the five components listed above was taken from a four-year average of measurements at Boise Fire Station 5. Also, ambient background concentrations for 1995

were estimated from the IMPROVE sampler operated at the Jarbidge Wilderness Area in northern Nevada.

The new component in this round of rollback modeling included updated annual emissions estimates of PM_{10}, NO_x, and SO_x for 1999 and several future years (Appendix A). The base year (1999) annual average PM_{10} concentration was 29.3 $\mu g/m^3$ measured at Boise Fire Station 5. The results of rollback modeling are summarized in Table 6-4 and Figure 6-5.

Table 6-4. Predicted PM_{10} levels by rollback modeling ($\mu g/m^3$).

Year	Geologic	Organic	Elemental Carbon	Ammonium Sulfate	Ammonium Nitrate	PM_{10}
1999	10.9	6.3	1.7	1.7	3.2	29.4
2010	12.3	7.5	2.0	1.9	3.7	34.0
2015	13.5	8.5	2.4	2.1	4.2	38.0
2020	13.4	8.6	2.4	2.1	4.2	38.0
2030	14.6	9.4	2.7	2.3	4.6	41.8

The future industrial emissions were based on maximum potential emissions for non-permitted facilities, and maximum allowable emissions for permitted facilities. It is therefore likely that future emissions for these sources are over estimated. From 2010 to 2020, industrial emissions are projected to remain at the same maximum potential level as in 2000. Hence, changes in projected concentrations between 2010 and 2020 are based on increases in mobile and area emissions due to population and economic growth.

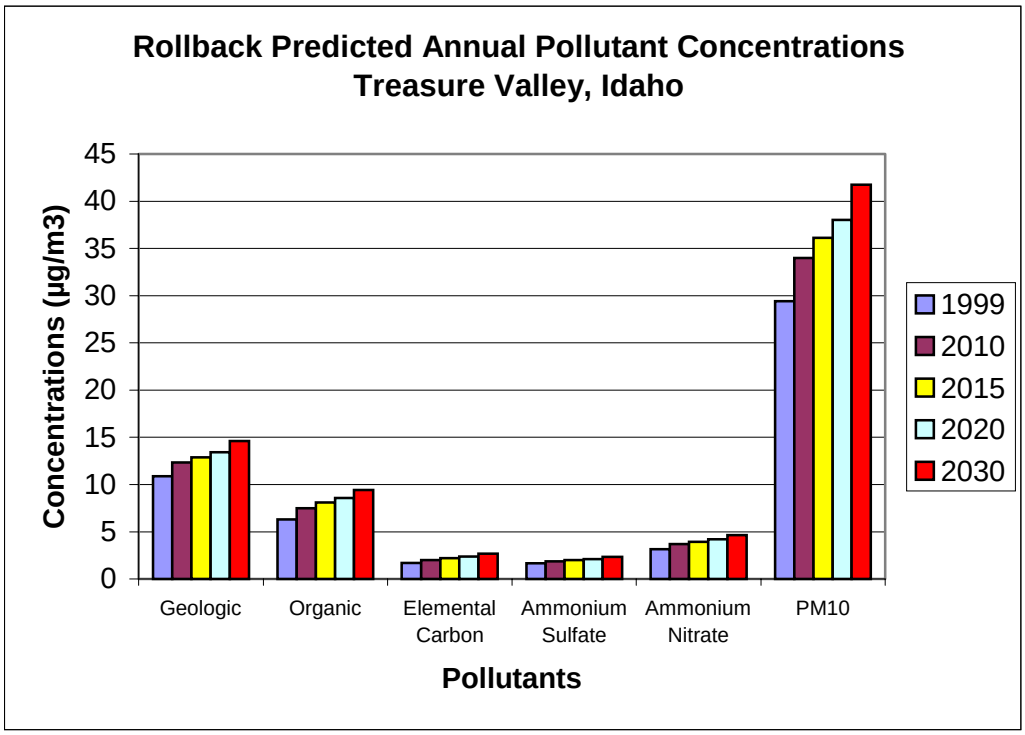

Figure 6-5. Prediction of annual average PM_{10} concentrations by speciated rollback modeling. The values for year 1999 were measured.

The model-predicted annual average PM10 concentration in the Treasure Valley for 2020 is 38 $\mu g/m^3$. According to the record of past years, the annual average concentration varies from year to year. This is primarily due to inter-annual fluctuations in the distribution of episodic weather patterns. The high-concentration days during winter stagnation episodes and smoke events during summer and fall make a significant contribution to the annual average concentrations. According to the data collected from 1994 through 2000, the PM10 concentration remained virtually constant when the highest 10% of days were filtered out, although the area was growing consistently. The results indicate that the control of episodic emissions during winter and summer/fall high PM_{10} events will be effective in lowering the annual average concentrations.

In addition, DEQ conducted episodic rollback modeling and the results show attainment through 2020 and thus provide further support to the redesignation of Northern Ada County to attainment. For more details, see Appendix E.

6.4 Ancillary Maintenance Demonstration Modeling

Appendix J provides a description of ancillary episodic and annual modeling that was undertaken to address certain issues that were identified during the coarse of the public comment period for the Draft Northern Ada County PM_{10} SIP. Specifically four changes were made to the PM_{10} modeling database:

1) The on-road motor vehicle emissions budget (MVEB) for NOx and VOC between 1999 and 2010 was increased to 1999 baseline levels, plus an additional 10% buffer. After 2010, the MVEB steps down to the 2015 MVEB as established in Appendix A.
2) The future year PM_{10} point source inventory was modified to: remove certain sources that were multiply-counted in the original future year inventory; reduce the permitted levels for one particular construction-related source; and account for the potential sale of PM_{10} emission credits.
3) CAMx was rerun for 2010 and 2015 to ensure that the 24-hour PM_{10} standard is maintained with the changes incorporated into the future year emissions inventory.
4) The annual speciated linear rollback model was rerun for 2010 to ensure maintenance of the annual PM_{10} standard through 2010 using the MVEB NOx changes described above.

The new episodic and annual modeling results show that the modifications to the future year emission inventory did not significantly alter the future year concentration estimates, and that the episodic and annual PM_{10} standards are maintained in all future years examined.

6.5 Continued Air Monitoring and Verification of Attainment

The DEQ is responsible for monitoring PM_{10} levels in the Treasure Valley, including Northern Ada County. DEQ commits to comply with the continued air monitoring requirement of Title III, Section 319, of the CAA. The PM_{10} sites are operated in compliance with EPA monitoring guidelines set forth in 40 CFR Part 58, Ambient Air Quality Surveillance, and Appendices A through G of Part 58.

On an annual basis, the DEQ will analyze the three most recent consecutive years of ambient PM_{10} monitored data to verify continued attainment of the NAAQS for PM_{10}, in accordance with 40 CFR part 50 and EPA's redesignation guidelines. In keeping with the requirements of Title III, Section 319, of the CAA (as defined in 40 CFR Part 58.26), the DEQ will continue to submit to EPA by July 1 of each year an annual report of PM_{10} data collected during the previous calendar year. These data, along with the data contained in the annual reports for the previous two years, will provide all the necessary information to determine whether Northern Ada County continues to comply with the PM_{10} NAAQS.

6.6 Permitting Program to Ensure that New Sources will not Jeopardize Continued Maintenance

Idaho Administrative Code rules for air pollution control, 58.01.01.204, Permit Requirements for New Major Facilities or Major Modifications in Nonattainment Areas and in the Former PM-10 Northern Ada County Nonattainment Area, Rules for the Control of Air Pollution in Idaho, applies to new major sources or major modifications of existing sources located in Northern Ada County "former PM_{10} nonattainment area." Following redesignation, the rules will apply for any major source or major modifications of existing sources located in the Northern Ada County maintenance area. These revised rules were submitted to EPA in 1999 and are under review at the present time. EPA will act upon approving (or disapproving) these new source review rules separately from this PM_{10} Maintenance Plan submittal. Industrial permitting rules are found in IDAPA 58.01.01.200-500, 58.01.01.650-651, and 58.01.01.600-616.

6.7 Commitment to Review and Update Maintenance Plan

The DEQ commits to submit a maintenance plan for the second ten-year period (2013-2023), as well as any necessary revision in the interim, as required in Section 110(a)(2)(H) of the CAA. *See 57 FR 13556.* Idaho State statutes (Idaho Code Section 39-10/et. seq.) provide the authority to the state to revise SIPs and subsequent regulations and thus satisfy the CAA requirements.

The DEQ will evaluate the implementation of the Maintenance Plan as part of its annual strategic plan update with the Region 10 office of the U.S. EPA. It will also coordinate the implementation of the plan with the Strategy for the Development of an Airshed Management Program for the Treasure Valley, an area containing all or portions of seven counties in southwest Idaho. This effort will allow a closer examination of the impact of rapidly growing Canyon County on the overall air quality planning process. Reviews of the Maintenance Plan will also be conducted on an as-needed basis, such as for transportation conformity budget purposes. As noted earlier, the design value for PM_{10} will be computed annually and the plan reviewed should a significant upward trend in design values occur. Finally, if any of the underlying EPA assumptions are modified, such as the motor vehicle emissions model or a large increase in industrial or fugitive dust emissions, the plan will be reviewed for possible revisions.

7.0 ADMINISTRATIVE REQUIREMENTS

7.1 Consultation and Public Notification Procedures

Section 110(a)(2)(M) requires that SIPs provide for public consultation and participation by affected local political subdivisions. *See 57 FR 13557.* The public participation efforts by DEQ and other agencies on the development of the Northern Ada County PM_{10} Maintenance Plan has been extensive, beginning with the settlement of the lawsuit with the Idaho Clean Air Force, et. al. These included the implementation of several provisions of the Settlement Agreement such as annual offsetting of growth of PM_{10} emissions from transportation sources in the temporary absence of a transportation conformity program in the former nonattainment area. Secondly, permit requirements for new or major modifications of existing facilities were upgraded to represent the review that would have occurred had Northern Ada County been under a nonattainment classification. These proposed rules were noticed and public workshops were held in late 2000 and then submitted to the EPA.

Public involvement has also occurred through the extensive series of open informational hearings conducted by the DEQ on air quality issues and strategies. On June 13, 2002, an informational workshop was held at DEQ offices to provide the public with information on the initial technical findings of the PM_{10} Maintenance Plan development as well as to explain the format and schedule for proposing and adopting the SIP.

The public comment period for the Maintenance Plan was open from August 6th, 2002 through September 5th, 2002, as required by IDAPA 58.01.01.578.04 (Rules for the Control of Air Pollution in Idaho), 40 CFR 51, Appendix V, 2.0. Criteria, and Section 110 of the Federal Clean Air Act. A public hearing was held on September 4th, 2002, in accordance with these rules.

Comment packages that included the Maintenance Plan and associated appendices were made available at DEQ's State Office in Boise, DEQ's Regional Office in Boise, and the Boise, Nampa, Caldwell, and Meridian Public Libraries. In addition, the Maintenance Plan was made available for review on DEQ's website. Comments were received by DEQ through postal mail, electronic mail, and verbal testimony at the Public Hearing.

Only eight public comments regarding the Maintenance Plan were received, and two individuals testified at the public hearing. Complete documentation of comments and public hearing testimony, plus responses, is contained in Appendix I.

DEQ received several comments supporting the Maintenance Plan and/or expressing appreciation of DEQ's public outreach efforts. These comments did not require a response or any changes to the document.

Comments noting typographical errors or requesting clarifications in text or tables were incorporated into the final document.

Some comments, such as the need for public education or the need to assess impacts to the economy, were outside of the scope of the Maintenance Plan. While DEQ values these

comments and will consider them in airshed management, they cannot be addressed within the Maintenance Plan.

DEQ also received a number of comments that raised issues or concerns that did not warrant changes to the Maintenance Plan. These included comments about model choice, the amount of monitoring and meteorological data available, the use of maximum potential emissions used for future year industrial emissions estimates, and other questions about technical decisions. For these comments, DEQ noted where information or technical justifications could be found in the document, or provided explanations.

Finally, the Maintenance Plan was modified in order to address a concern raised by the U.S. Environmental Protection Agency. They noted that the NOx and VOC budgets identified in Section 4-3 are less than NOx and VOC emissions for on-road and road dust sources identified for the base year and 2010 in Table 4-10. They recommended correcting this by adding a margin of safety to avoid a determination that the Motor Vehicle Emissions Budgets for these pollutants are inadequate. This change has been incorporated into the final document.

7.2 Prohibition of Sources from Impacting Other States

Section 110 (a)(2)(D) of the CAA requires that DEQ certify that the former nonattainment area of Northern Ada County is located sufficiently away from any adjacent states, i.e., Oregon or Nevada, that its sources are precluded from impacting the other states. *See 57 FR 13556.* Review of current ambient air quality data reveals that there are no PM_{10} exceedances in either adjacent areas of Oregon or Nevada. While Ontario, Oregon, lies just across the Snake River from the Boise Metropolitan Area, sources in both Canyon and Ada counties will continue to be controlled or have permits that will limit their growth under the Maintenance Plan and are not expected to impact Oregon in the foreseeable future.

7.3 Assurance of Adequate Funding, Personnel, and Authority

Section 110(a)(2)(E) of the CAA requires that the State have adequate funding, staff, and legal authority to implement the Maintenance Plan. *See 57 FR 13556.*

The state of Idaho has adequate funding, personnel and authority to enforce the emissions limitations and control measures listed in this plan and certify that these controls are in compliance with state and federal law. The Idaho Environmental Protection and Health Act gives authority to the Director of the Idaho DEQ to supervise and administer a system to safeguard air quality in the state of Idaho.

1. Personnel

DEQ has a Permits and Enforcement Bureau staffed by over 50 employees, including engineers and inspectors. The Southwest Idaho Regional Office has two field staff that spends a significant amount of their time servicing the Ada County/Boise PM_{10} monitoring network and administering the PM_{10} program. DEQ headquarters has five other staff that spend part of their time either reviewing meteorological conditions and declaring burn bans and/or

conducting necessary quality assurance on air monitoring data, or overseeing the wood smoke program in the Ada County/Boise PM_{10} nonattainment area. Similarly, personnel are available at the county and municipal level for enforcing curtailments programs in Garden City, Eagle and Meridian, and unincorporated Ada County.

2. Funding

Implementation of the selected control measures relies on funding from a variety of sources. DEQ's Air Programs base grant is one main source, which funds planning, compliance, curtailment, air monitoring and surveillance in the Ada County/Boise PM_{10} nonattainment area. Idaho has and expects to maintain staffing levels adequate to continue such implementation.

3. Authority

Idaho Code § 39-105(3)(j). Idaho Code §§ 39-105 and 39-107 authorize the Board of Environmental Quality to promulgate rules governing air pollution.

State Statute (Idaho Code Section 39-10/et. seq.) These codes give authority for SIP development including regulation development to the Administrator of the DEQ.

7.4 Control Requirements Applied to Major Sources of PM_{10} Precursors

Section 189(e) of the CAA provides that the control requirements for major stationary sources of PM_{10} shall also apply to major stationary sources of PM_{10} precursors, except where the Administrator determines that such sources do not contribute significantly to PM_{10} levels that exceed the standard in the area. *See FR 13539-42.*

EPA's May 30, 1996 approval of the original PM_{10} SIP *(See 61 FR 27021, section 6)* concluded that imposing additional control requirements on major sources of PM_{10} precursors is not necessary. Dispersion modeling studies conducted as part of this SIP development effort further confirmed that precursors, such as sulfates and nitrates, were less than 3% and 8%, respectively of the observed and predicted PM_{10} mass budgets over December 22-24, 1999.

7.5 Applicable Idaho Administrative Code

The Rules for the Control of Air Pollution in Idaho are located in the Idaho Administrative Code at IDAPA 58.01.01. Both the air quality Permit(s) to Construct and Tier II operating permit programs require a demonstration that the air pollution source at issue will not cause or contribute to a violation of a national ambient air quality standard (See IDAPA 58.01.01.203.02 and 58.01.01.403.02). Generally, estimates of ambient concentrations are based on applicable air quality models, data bases, and other requirements specified in 40 CFR Part 51, Appendix W (Guidance on Air Quality Models) and (IDAPA 58.01.01.202.02 and 58.01.01.402.03). Thus, because the permitting rules require a NAAQS demonstration new sources cannot jeopardize continued maintenance of the NAAQS PM_{10} standard.

In addition to permitting authorities, the state has the authority to implement controls in response to air pollution forecasts, alerts, warnings, and emergency episodes (IDAPA 58.01.01.550 through 58.01.01.562).

Transportation Conformity rules are located at IDAPA 58.01.01.563 through 58.01.01.574.

It should be noted that DEQ has implemented the PM_{10} NAAQS since its initial promulgation in 1987.

8.0 CONCLUSIONS AND REQUEST FOR REDESIGNATION

This maintenance plan demonstrates that the ambient air quality for the PM_{10} NAAQS in northern Ada County is and will be protected for at least the next ten years. On May 30, 1996, EPA approved the applicable attainment plan for the area pursuant to Section 110(k) of the CAA (61 Fed. Reg. 27019). The continued improvement in the air quality in northern Ada County since 1991 has been the result of permanent and enforceable rules contained in the attainment plan and other actions taken by state and local authorities. Since enactment of the key control strategies of the 1991 attainment plan (residential wood burning and open burning programs) ambient concentrations of PM_{10} have continued to decrease despite rapid population growth in the area. The state of Idaho will continue to aggressively monitor PM_{10} concentrations in northern Ada County over the next ten years. If violations occur or are expected to occur, this maintenance plan contains contingency provisions to ensure prompt corrective action is taken. This maintenance plan fulfills the requirements of Section 175A of the CAA. Thus, DEQ requests that EPA designate northern Ada County attainment for the PM_{10} NAAQS in accordance with Section 107 of the CAA.